# DENSO

Bar Code Handy Terminal

# BHT-300B

## User's Manual

# Preface

Please READ through this manual carefully. It will enable you to operate your BHT-300B correctly.

After you have finished reading the instructions, keep this manual handy for speedy reference.

# How this book is organized

This manual is made up of five chapters and appendices.

## Chapter 1  Quick Guide

Describes the basic operating method of the BHT-300B and the related notes.

## Chapter 2  Getting Started the BHT and System Mode

Outlines the system configuration and presents the operating procedures for the BHT-300B, including preparation and System Mode operation. In System Mode, you can set various parameters to efficiently run application programs.

## Chapter 3  Communications Operations of BHT

Outlines the BHT's communications capabilities necessary for performing data and program transfer between the BHT-300B and host PC or other devices: infrared (Ir) communication, RS-232C interface specifications, and the basic communications specifications.

## Chapter 4  Error Messages

Lists the error messages which will appear on the LCD if some error occurs in the BHT.

## Chapter 5  Handling the CU-300 (Option)

Describes the handling procedure of the communication unit CU-300, the interfacing with the host PC, and the charging of the battery cartridge. This chapter also describes the LAN-support communication unit CU-311.

## Appendix A:  Specifications
## Appendix B:  A Typical Basic Operation

## ■ Technical Terms Used in This Manual

**Source Program and Object Program (User Program)**

Generally, a source program is translated into an object program by a compiler. This manual calls an object program a user program.

**BHT-BASIC**

This manual expresses BHT-BASIC 4.0 as BHT-BASIC.

## ■ Related Publications

BHT-BASIC Programmer's Manual (BHT-300 series)
BHT-BASIC 4.0 Transfer Utility User's Guide

## ■ Screen Indication

The lettering in the screens in this manual is a little different from that in the actual screens. File names used are only for description purpose, so they will not appear if you have not set files having those names.

# SAFETY PRECAUTIONS

## Be sure to observe all these safety precautions.

■ Please READ through these instructions carefully. They will enable you to use the BHT and CU correctly.

■ Always keep this manual nearby for speedy reference.

Strict observance of these warnings and cautions is a MUST for preventing accidents that could result in bodily injury and substantial property damage. Make sure you fully understand all definitions of these terms and symbols given below before you proceed to the text itself.

| ⚠ WARNING | Alerts you to those conditions which could cause serious bodily injury or death if the instructions are not followed correctly. |
|---|---|
| ⚠ CAUTION | Alerts you to those conditions which could cause minor bodily injury or substantial property damage if the instructions are not followed correctly. |

## Meaning of Symbols

A triangle (⚠) with a picture inside alerts you to a warning of danger. Here you see the warning for electrical shock.

A diagonal line through a circle (⊘) alerts you to something you should not do; it may or may not have a picture inside. Here you see a screwdriver inside the circle, meaning that you should not disassemble.

A black circle (●) with a picture inside alerts you to something you MUST do. This example shows that you MUST unplug the power cord.

# ⚠ WARNING

**To System Designers:**

- When introducing BHTs in those systems that could affect human lives (e.g., medicines management system), develop applications carefully through redundancy and safety design which avoids the feasibility of affecting human lives even if a data error occurs.

**Handling the battery cartridge**

- Never disassemble or heat the battery cartridge, nor put it into fire or water; doing so could cause battery-rupture or leakage of battery fluid, resulting in a fire or bodily injury.

- Do not carry or store the battery cartridge together with metallic ball-point pens, necklaces, coins, hairpins, etc.
  Doing so could short-circuit the terminal pins, causing the batteries to rupture or the battery fluid to leak, resulting in a fire or bodily injury.

- Never put the battery cartridge into a microwave oven or high-pressure container.
  Doing so could cause the batteries to break, generate heat, rupture or burn.

- Avoid dropping the battery cartridge or letting it undergo any shock or impact.
  Doing so could cause the batteries to break, generate heat, rupture or burn.

- Only use the dedicated charger for charging the battery cartridge.
  Using a different type of charger could cause battery-rupture or leakage of battery fluid and result in a fire, bodily injury, or serious damage to property.

- Never charge the lithium-ion battery cartridge where any inflammable gases may be emitted; doing so could cause fire.

**Handling the BHT**

- Never put the BHT into a microwave oven or high-pressure container.
  Doing so could cause the BHT to break, generate heat, rupture or burn.

**Handling the CU**

- If smoke, abnormal odors or noises come from the CU, immediately unplug the AC adapter from the wall socket, disconnect the interface cable, and contact your nearest dealer.
  Failure to do so could cause fire or electrical shock.

- Never put the CU into a microwave oven or high-pressure container.
  Doing so could cause the CU to break, generate heat, rupture or burn.

# ⚠ WARNING

- If foreign material or water gets into the CU, immediately unplug the AC adapter from the wall socket or CU, disconnect the interface cable, and contact your nearest dealer.
  Failure to do so could cause fire or electrical shock.

- If you drop the CU so as to damage its housing, immediately unplug the AC adapter from the wall socket or CU, disconnect the interface cable, and contact your nearest dealer.
  Failure to do so could cause fire or electrical shock.

- Never use the CU for charging anything other than the specified battery cartridges.
  Doing so could cause heat, battery-rupture, or fire.

- Never bring any metals into contact with the output terminals.
  Doing so could produce a large current through the CU, resulting in heat or fire, as well as damage to the CU.

- Use the dedicated AC adapter only.
  Failure to do so could result in fire.

- Never use the CU on the line voltage other than the specified level.
  Doing so could cause the CU to break or burn.

- If the power cord of the AC adapter is damaged (e.g., exposed or broken lead wires), stop using it and contact your nearest dealer.
  Failure to do so could result in a fire or electrical shock.

# ⚠ CAUTION

**Handling the battery cartridge**

- Never charge a wet or damp rechargeable battery cartridge.
  Doing so could cause the batteries to break, generate heat, rupture, or burn.

**Handling the BHT**

- Never put the BHT in places where there are excessively high temperatures, such as inside closed-up automobiles, or in places exposed to direct sunlight.
  Doing so could affect the housing or parts, resulting in a fire.

- Avoid using the BHT in extremely humid or dusty areas, or where there are drastic temperature changes.
  Moisture or dust will get into the BHT, resulting in malfunction, fire or electrical shock.

# ⚠ CAUTION

- Never disassemble or modify the BHT; doing so could result in an accident such as break or fire.

  Never disas-semble

- If smoke, abnormal odors or noises come from the BHT, immediately turn off the power, pull out the battery cartridge, and contact your nearest dealer.
  Failure to do so could cause smoke or fire.

- If foreign material or water gets into the BHT, immediately turn off the power, pull out the battery cartridge, and contact your nearest dealer.
  Failure to do so could cause smoke or fire.

- If you drop the BHT so as to damage its housing, immediately turn off the power, pull out the battery cartridge, and contact your nearest dealer.
  Failure to do so could cause smoke or fire.

- Do not use batteries or power sources other than the specified ones; doing so could generate heat or cause malfunction.

- In environments where static electricity can build into significant charges (e.g., if you wipe off the plastic plate with a dry cloth), do not operate the BHT. Doing so will result in malfunction or machine failure.

- When connecting or disconnecting the direct-connect interface cable to/from the BHT, do not plug or unplug it at an angle and do not pull the cable strongly. Doing so will result in a machine failure.

- If the BHT has been stored in a hot (50°C to 60°C, 122°F to 140°F) and humid place, allow it to sit at room temperature and humidity for at least one day before use. Using the BHT with its inside being hot will fail to scan or result in a machine failure.

## Handling the CU

- Never put the CU in places where there are excessively high temperatures, such as inside closed-up automobiles, or in places exposed to direct sunlight.
  Doing so could affect the housing or parts, resulting in a fire.

- Avoid using the CU in extremely humid or dusty areas, or where there are drastic temperature changes.
  Moisture or dust will get into the CU, resulting in malfunction, fire or electrical shock.

- Never disassemble or modify the CU; doing so could result in an accident such as fire or malfunction.

# ⚠ CAUTION

- If you will not be using the CU for a long time, be sure to unplug the AC adapter from the wall socket and disconnect the interface cable for safety.
  Failure to do so could result in a fire.

- When caring for the CU, unplug the AC adapter from the wall socket and disconnect the interface cable for safety.
  Failure to do so could result in an electrical shock.

- Never cover or wrap up the CU or AC adapter in a cloth or blanket.
  Doing so could cause the unit to heat up inside, deforming its housing, resulting in a fire.
  Always use the CU and AC adapter in a well-ventilated area.

- Do not place the CU anyplace where it may be subjected to oily smoke or steam, e.g., near a cooking range or humidifier.
  Doing so could result in a fire or electrical shock.

- Keep the power cord away from any heating equipment.
  Failure to do so could melt the sheathing, resulting in a fire or electrical shock.

- Do not insert or drop foreign materials such as metals or anything inflammable through the openings or vents into the CU.
  Doing so could result in a fire or electrical shock.

---

- ■ DENSO WAVE INCORPORATED does not assume any product liability arising out of, or in connection with, the application or use of any product, circuit, or application described herein.

- ■ If it is judged by DENSO WAVE INCORPORATED that malfunction of the product is due to the product having been dropped or subjected to impact, repairs will be made at a reasonable charge even within the warranty period.

- ■ Intellectual Property Precaution

  DENSO WAVE INCORPORATED ("DENSO WAVE") takes reasonable precautions to ensure its products do not infringe upon any patent of other intellectual property rights of other(s), but DENSO WAVE cannot be responsible for any patent or other intellectual property right infringement(s) or violation(s) which arise from (i) the use of DENSO WAVE's product(s) in connection or in combination with other component(s), product(s), data processing system(s) or equipment or software not supplied from DENSO WAVE; (ii) the use of DENSO WAVE's products in a manner for which the same were not intended nor designed; or (iii) any modification of DENSO WAVE's products by other(s) than DENSO WAVE.

# ■ Proper Care of the BHT and CU

Clean the BHT's charge terminals and battery cartridge terminals with a cotton swab or the like periodically. Clean the BHT housing with a dry, soft cloth. Before cleaning, be sure to turn the BHT off and unplug the AC adapter of the CU.

- Never use benzene, alcohol, or other organic solvents. The housing may be marred or the paint may come off.

- Never rub or strike the liquid crystal display (LCD) with anything hard. The LCD surface will be easily scratched or broken.

- When cleaning the keypad, do not scrub the surface too hard. Doing so may break the keys.



- If the BHT or CU becomes smudged, moisten a soft cloth with neutral detergent and wring it out thoroughly. Wipe the BHT or CU with the cloth and then go over it again with a dry cloth.

Dust or dirt accumulating on the clear plate of the bar-code reading window will affect reading performance. If you use the BHT in dusty areas, therefore, periodically check the clear plate of the bar-code reading window and clean it if dusty.

- To clean the plate, first blow the dust away with an airbrush. Then wipe the plate with a cotton swab or the similar soft one gently.

- If sand or hard particles have accumulated, never rub the plate; doing so will scratch or damage it. Blow the particles away with an airbrush or a soft brush.

# ■ Limited Warranty on Software Products

In no event will DENSO WAVE INCORPORATED be liable for direct, indirect, special, incidental, or consequential damages (including imaginary profits or damages resulting from interruption of operation or loss of business information) resulting from any defect in the software or its documentation or resulting from inability to apply the software or its documentation.

# FCC Regulations

This device complies with Part 15 of the FCC Rules.

Operation is subject to the following two conditions:

(1) this device may not cause harmful interference, and

(2) this device must accept any interference received, including interference that may cause undesired operation.

**NOTE:** This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

**FCC WARNING:** Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

# Canadian Interference-Causing Equipment Regulations

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

**Chapter 1  Quick Guide**

**Chapter 2  Getting Started the BHT and System Mode**

**Chapter 3  Communications Operations of BHT**

**Chapter 4  Error Messages**

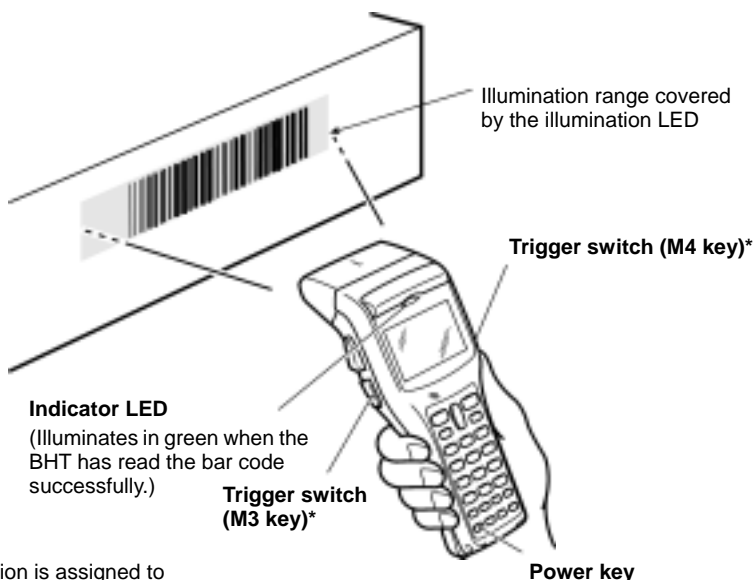**Chapter 5  Handling the CU-300 (Option)**

**Appendices**

# Chapter 1

# Quick Guide

This chapter describes the basic operating method of the BHT-300B and the related notes.
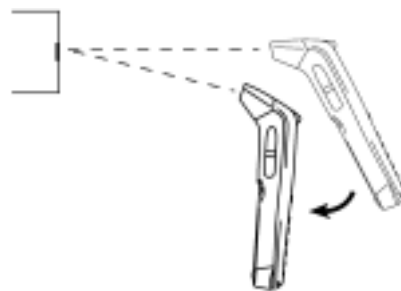
# 1.1   Reading Bar Codes

Turn the BHT on, bring the bar-code reading window to a bar code to be scanned, and press the trigger switch. The BHT turns on the illumination LED to scan the bar code.

When the BHT has read the bar code successfully, the indicator LED will illuminate in green.



Illumination range covered by the illumination LED

**Trigger switch (M4 key)\***

**Indicator LED**
(Illuminates in green when the BHT has read the bar code successfully.)

**Trigger switch (M3 key)\***

**Power key**

\* The trigger switch function is assigned to both of the **M3** and **M4** keys by default.

- If the BHT fails to read due to specular effects or other factors, change the scanning angle of the reading window or the distance from codes as shown at right, and try it again. (Specular effects occur when the reflection of the light from the bar code becomes excessively strong. This can easily happen when the reflecting surface is polished or covered with vinyl.)

- To read bar codes wider than the readable area of the bar-code reading window, pull the bar-code reading window away from bar codes.

- The BHT can read bar codes at a maximum distance of 45 cm (17.7")\*\* from the bar-code reading window. (\*\*For details about the scanning conditions, refer to Appendix A.)

- The bar code reading procedure may differ depending upon the application used, so follow the application's manual.

NOTE
- Before reading bar codes, clean their labels if stained.
- Avoid using the BHT in direct sunlight. The BHT might fail to read correctly.
  - To read bar codes on curved surfaces, apply the bar-code reading window to the center of each bar code at a right angle.
  - If you pull the bar-code reading window away from bar codes, the actual scanning range will become narrower than the range covered by the illumination LED.
  - The light intensity of the illumination LED will vary depending upon the scanning conditions and variation of its elements.
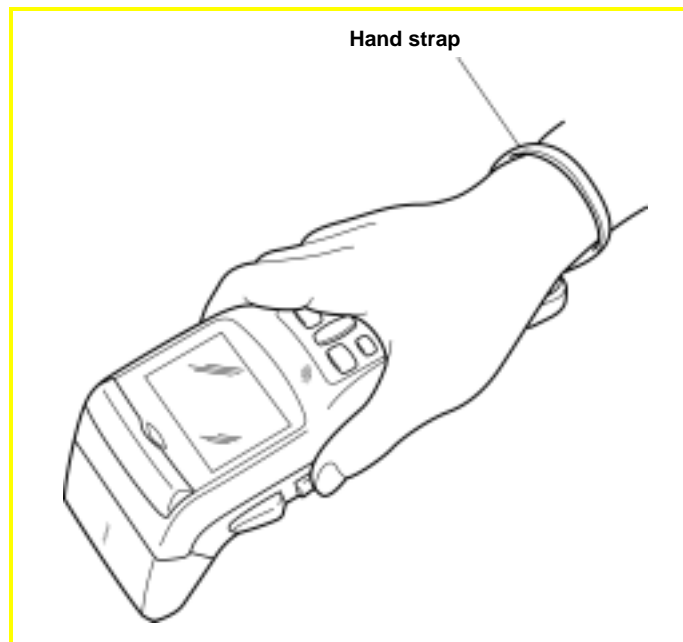
# 1.2  Setting and Using the Hand Strap
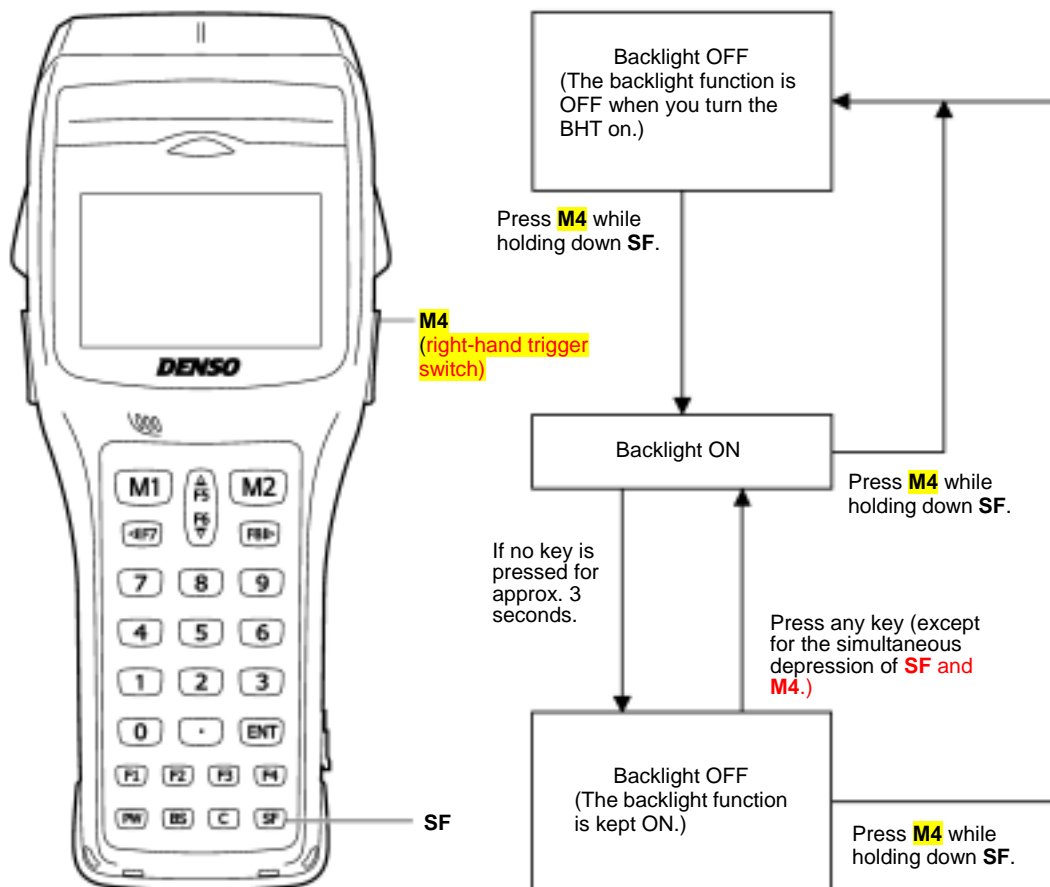
## ■ Setting the hand strap

## ■ Using the hand strap

Put your hand through the hand strap and hold the BHT as shown below. This will prevent you from dropping the BHT accidentally.

Hand strap

# 1.3 Setting the Backlight

Pressing the **M4** key (right-hand trigger switch) while holding down the **SF** (Shift) key activates or deactivates the backlight function.



Backlight OFF
(The backlight function is OFF when you turn the BHT on.)

Press **M4** while holding down **SF**.

M4
(right-hand trigger switch)

Backlight ON

Press **M4** while holding down **SF**.

If no key is pressed for approx. 3 seconds.

Press any key (except for the simultaneous depression of **SF** and **M4**.)

SF

Backlight OFF
(The backlight function is kept ON.)

Press **M4** while holding down **SF**.

NOTE    In user programs, you can select the key to be used for activating or deactivating the backlight function (instead of the initial setting: combination of **SF** and **M4** key (right-hand trigger switch)), as well as modifying the ON-duration of the backlight before the automatic turning-off.

# 1.4   Using the Keypad

## ■ Entering Numerical Data

To enter numerical data, e.g., the quantity of goods, use the numerical keys and the **ENT** key.

For example, to enter the number "120," press the **1**, **2** and **0** keys and then press the **ENT** key.

If you key in any wrong value, press the **C** key or **BS** key and then enter the correct one.

## ■ Selecting Tasks

If the LCD shows the selection items (xxx) prefixed by numerals (e.g., 1: xxx, 2: xxx), use the numerical keys to select a desired item and press the **ENT** key to execute. If a YES/NO screen (e.g., 1: YES, 2: NO) appears, press the **1** key for YES response and **2** key for NO response.

## ■ Entering Alphabetic Characters

The BHT supports the alphabet input function which allows you to enter alphabetic characters, space, and symbols from the keypad during execution of a user program. For the alphabet input procedure, refer to the "BHT-BASIC Programmer's Manual."

# 1.5  Transferring Data

## ■ Using infrared link

The BHT uses infrared rays to transfer data to IrDA-compliant devices (communication unit CU or other BHTs).

Communication with the CU

Place the BHT on the CU (option) as shown below.

The CU-301 or CU-321 can be connected to the host with an RS-232C or USB interface cable, respectively.

In a LAN communications system, use the combination of the LAN-support BHT* (as a LAN client) and the CU-311 connected to Ethernet with an Ethernet interface cable.

*BHT on which LAN-support software is installed
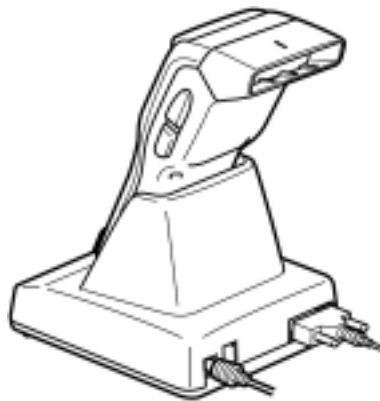


Communication between BHTs



BHT                                                          BHT

NOTE
- Make sure that there is no obstruction in the light path between the BHT and any target stations. In infrared communication, you need to keep the BHT and any target stations within the effective infrared radiation range, usually 15 cm (5.91") or less.
- Shield the IrDA interface from direct sunlight, ambient intense lighting (inverter-driven fluorescent lighting, in particular), and other potential sources of infrared radiation. Sources to watch out for include remote control units for television sets and the like.

# Chapter 2

# Getting Started the BHT and System Mode

This chapter outlines the system configuration and presents the operating procedures for the BHT-300B, including preparation and System Mode operation. In System Mode, you can set various parameters to efficiently run application programs.

# 2.1   BHT System Configuration

The BHT barcode data collection system requires the following hardware as well as the BHT Bar Code Handy Terminal (which reads bar codes and accepts keypad entry) as illustrated below:

- Host PC:                              Allows you to edit, manage and download user programs and data, as well as downloading system programs.

- CU-301/321 (option):              Exchanges programs and data with the BHT via the IrDA interface and with the host PC via the RS-232C interface (CU-301) or USB interface (CU-321).

- RS-232C interface cable (option):   Connects the CU-301 and the host PC with each other.

- USB interface cable (option):        Connects the CU-321 and the host PC with each other.

Direct cable connection between the BHT and host PC is also possible.

Optional software includes the BHT-BASIC 4.0 Development Pack and BHT-BASIC4.0 Transfer Utility.

## System Configuration

### IrDA communications system
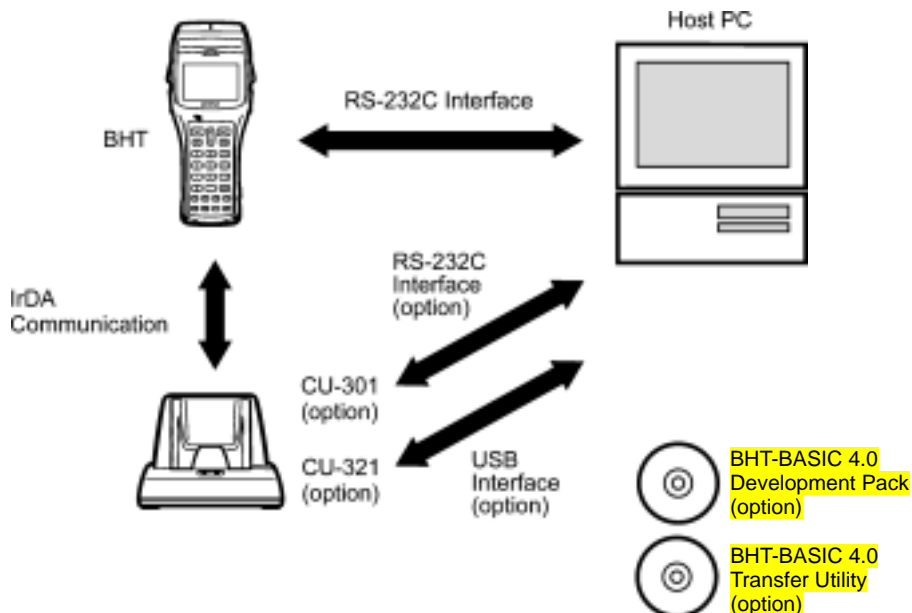
The LAN-support BHT can operate as a LAN client in a LAN communications system by connecting to Ethernet via the LAN-support communication unit CU-311 (option).

- CU-311 (option):     Exchanges programs and data with the BHT via the IrDA interface and with the host PC via Ethernet.

**LAN communications system**
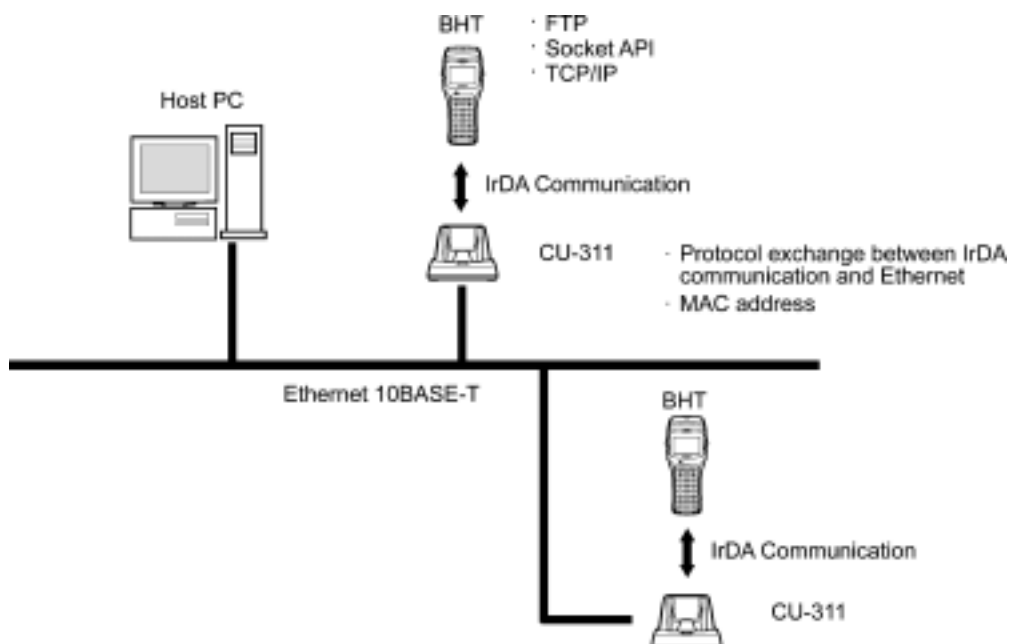


For details about FTP and Socket API, refer to the BHT-BASIC Programmer's Manual.

<span style="background-color: yellow">**NOTE:** LAN configurations are available only with LAN-support BHTs on which LAN-support software is installed.</span>

## ■ Host PC

Models: PC/AT, PS/2

**Operating Systems and Optional Application Programs**

| Operating Systems (OS) | Win98 | WinNT 3.51/4.0 | Win2000 Professional | Win XP |
|---|---|---|---|---|
| BHT-BASIC 4.0 Development Pack<br>• BHT-BASIC 4.0 Compiler<br>• BHT-BASIC4.0 Remote Debugger | – | – | √ | √ |
| BHT-BASIC4.0 Transfer Utility* | √ | √ | √ | √ |

*This application does not activate any built-in IrDA interface port.

## ■ CU-301/321 and RS-232C/USB Interface Cable (options)

The CU-301/321 is an optical communication unit for the BHT-300B. It controls data and program transfer between the BHT and host PC. It communicates with the BHT using infrared (Ir) light and with the host PC over an RS-232C cable (for CU-301) or USB cable (for CU-321).

You can directly connect two BHTs with each other by using a commercially available metal cable having 3-pole mini stereo plugs (as a direct-connect interface cable). You also connect the BHT directly with the host PC or with the modem by using the direct-connect interface cable compatible with the target equipment. (**NOTE:** The direct-connect interface port of the BHT is not designed to stand frequent connecting/disconnecting. You are, therefore, recommended to use the CU-301/321 where you expect to do a lot of connecting and disconnecting of the BHT to/from a host PC.)

## ■ BHT-BASIC 4.0 Development Pack (option)

The BHT-BASIC 4.0 development pack is a package that contains a full set of tools necessary for developing applications for the BHT series. It allows you to jump-start your development work.

• BHT-BASIC 4.0 Compiler

  Compiles and links a source program written in BHT-BASIC 4.0 to create a user program executable on the BHT (*.PD4).

• BHT-BASIC 4.0 Remote Debugger

  Debugs application programs running on the BHT.

• BHT-BASIC4.0 Transfer Utility

  Transfers a user program (*.PD4) to the BHT. For details, see "BHT-BASIC4.0 Transfer Utility" below.

• BHT-PC Cable (RS-232C)

## ■ BHT-BASIC4.0 Transfer Utility (option)

Running on the host PC, this utility transfers files between the BHT and the host PC, using YMODEM or BHT-Ir protocol.

## Software Structure

System Programs and JIS Level 1 & Level 2 fonts are resident in the system area and user area, respectively.

To execute user programs, you should download the program files (*.PD4) into the user area.

To use data files (e.g., good master files) required for execution of user programs, you should download those data files before execution of user programs. Those files will be stored in the user area.
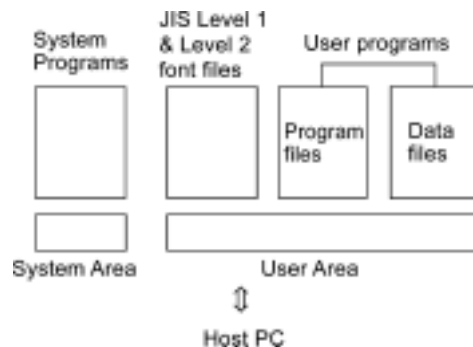


## ■ System Programs

The system programs include the following three sets of programs:

### Drivers

Drivers is a set of programs that directly controls the BHT hardware. It can be called up by the BHT-BASIC Interpreter or System Mode.

### BHT-BASIC Interpreter

The interpreter interprets and executes instructions in user programs written in BHT-BASIC.

<u>System Mode</u>

System Mode is a system program exclusively designed for the effective use of user programs in the BHT. It sets up the execution environments for those programs; e.g., it prepares downloading/uploading conditions, sets the calendar clock, and tests the BHT components including the LCD, beeper, and keypad. Shown below is the System Mode menu (SYSTEM MENU).

```
          SYSTEM MENU

      1:EXECUTE PROGRAM
      2:DOWNLOAD
      3:UPLOAD
      4:SET SYSTEM
      5:TEST
      6:VERSION
      7:FTP
```

## ■ JIS Level 1 and Level 2 Font Files

These files contain font data required for displaying Kanji characters on the LCD.

The BHT can display Kanji characters of 16-dot and 12-dot fonts and their double-width ones in application programs.

TIP   If you do not need to display Kanji characters, you may delete these JIS font files. After deletion, the memory area which was occupied by these files can be used as a user area. For the deleting procedure, refer to Section 2.4, "Initializing the BHT System" or Section 2.5.3, "[ 9 ] Deleting Font Files."

The names of the JIS font files are:

FNT16J1.FN3 (JIS Level 1 font, 16-dot)
FNT16J2.FN3 (JIS Level 2 font, 16-dot)
FNT12J1.FN3 (JIS Level 1 font, 12-dot)
FNT12J2.FN3 (JIS Level 2 font, 12-dot)

## ■ User Programs

You can develop application programs to meet individual job requirements by using the BHT-BASIC Compiler. To download those user programs to the BHT, use the BHT-BASIC4.0 Transfer Utility.

# 2.2 Components and Functions

**Liquid crystal display (LCD)**
Shows the characters and graphic patterns.

**Indication LED**
Illuminates in green when the BHT has successfully read a bar code.

**Trigger switch (M4 key)**
Press this switch to start bar-code reading.

**Trigger switch (M3 key)**
Press this switch to start bar-code reading.

**IrDA interface port**
Used to exchange data/programs with the optical communication unit CU-300 or other BHTs.

**Hand strap**
Be sure to put your hand through this strap to prevent you from dropping the BHT accidentally.

**Bar-code reading window**

**Battery cover lock**
Use this to lock or unlock the battery cover.

**Battery cover**
Remove this cover to replace the battery cartridge.

**Connector cover**
Inside this cover is the direct-connect interface port.

The functions of the keys can be set by user programs. Shown below is a set of sample functions.

**Trigger switch (M3 key)**

**Trigger switch (M4 key)**

**Magic keys (M1 to M4)**

Each of the **M3** and **M4** keys is assigned a trigger switch by default.

Depending upon definition in System Mode or in user programs, **M1** to **M4** keys can also be used as any of the trigger switch, **SF** key, **ENT** key and backlight function on/off key. These keys can be also assigned string data.

**Cursor keys (F5 to F8)**

Used to move up to the preceding line, down to the next line, to the preceding character, and to the next character.

**Numerical keys**

Used for data input.

**ENT (Enter) key**

Finalizes the input data or operations, and starts the corresponding processing.

**Function keys**

Used for choosing functions.

**Power key**

Turns the BHT on or off.

**SF (Shift) key**

Used in combination with numerical keys for special input procedures.

**BS (Backspace) key**

Moves back one character.

**C (Clear) key**

Clears the last entered data or returns to the original screen.

15

# 2.3 Preparation

## 2.3.1 Setting-up 1: Loading the Battery Cartridge

Before the first use of the BHT, be sure to load the battery cartridge as shown below. The battery cartridge is not loaded in the BHT when shipped from the factory.

(1) Turn the BHT upside down.

(2) As shown below, slide the battery cover lock in the direction of the arrow and remove the battery cartridge cover.

(3) Check the polarity (positive and negative) of the battery cartridge. Then, load it so that the end of the battery pull strap appears above the battery cartridge as shown below. This facilitates easy removal of the battery cartridge.

(4) Put the battery cartridge cover back into place taking care not to pinch the battery pull strap between its cover and the bottom cover. Then, return the battery cover lock to its original position.

(5) Place the BHT on the CU-300 to charge the battery cartridge.
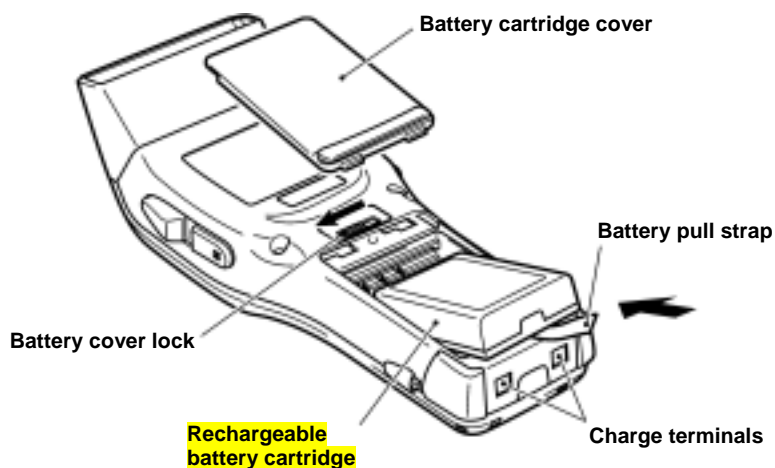


| ⚠ WARNING | • Never disassemble or heat the battery cartridge, nor put it into fire or water; doing so could cause battery-rupture or leakage of battery fluid, resulting in a fire or bodily injury. | 🚫 |
|---|---|---|
| | • Do not carry or store the battery cartridge together with metallic ballpoint pens, necklaces, coins, hairpins, etc. Doing so could short-circuit the terminal pins, causing the batteries to rupture or the battery fluid to leak, resulting in a fire or bodily injury. | 🚫 |

| ⚠ **WARNING** | • Avoid dropping the battery cartridge or letting it undergo any shock or impact.<br>Doing so could cause the batteries to break, generate heat, rupture or burn.<br><br>• Never charge the battery cartridge where any inflammable gases may be emitted; doing so could cause fire. | 🚫<br><br>🚫 |
|---|---|---|

| ⚠ **CAUTION** | • Do not use batteries or power sources other than the specified ones; doing so could generate heat or cause malfunction. | 🚫 |
|---|---|---|

**NOTE**
• The BHT has an integrated rechargeable backup power source which backs up the memory and calendar clock in the BHT when no battery cartridge is loaded or the voltage level of the battery cartridge drops below the specified level. The backup power source is automatically charged by the battery cartridge.

When you first load the battery cartridge after purchase or you load it after leaving the BHT unused for a long time, do not remove the battery cartridge for 10 minutes or more after that loading. This is for charging the memory backup source integrated in the BHT.

• If you leave the BHT without a battery cartridge loaded for a long time, the memory contents will no longer be backed up so that the message "Contact your administrator. Note the error number. (XXXX)" or "Set the current date and time." may appear on the LCD.

• If you will not be using the BHT for a long time, follow the instructions given in Section 2.3.5, "Battery Replacement Notes."

• Avoid storing the rechargeable battery cartridge in a hot place. The battery capacity may be decreased.

• Do not touch the charge terminals of the battery cartridge or stain them. Doing so could result in a BHT failure or cartridge charging failure. It is recommended that you wipe those battery cartridge terminals and the BHT's charge terminals with a dry, soft cloth periodically.

■ **Checking the Battery Voltage Level**

Pressing the **ENT** key while holding down the **SF** key displays the current voltage level of the power source (battery cartridge) as a bar indicator. (Releasing those keys erases the indication.)

For details, refer to Section 2.3.4, "Displaying the Battery Voltage Level and System Status."

# ■ Low Battery Indication

## Low battery warning

If the output voltage (of the battery cartridge) drops below a specified lower level while the BHT is in operation, the BHT displays the following warning message for approx. 2 seconds and beeps three times. After that, it will resume the previous regular operation.

```
Battery voltage
        has lowered.
```

The battery cartridge will need to be recharged before long. Recharge it as soon as possible.

## Shutdown due to low battery

If you continue to use the BHT without replacement or recharge of the battery cartridge after the low battery warning message appears, then the BHT displays the following message, beeps five times, and then turns itself off. Depending upon the battery level, the beeper may not sound five times.

```
Charge the
        battery!
```
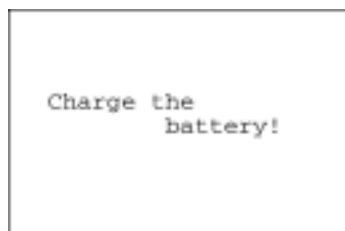
Replace or recharge the battery cartridge.

NOTE
- Before battery replacement, be sure to turn the BHT off. Within three minutes from the removal of the battery cartridge, load the battery cartridge to avoid data loss. After battery replacement, turn the BHT on and check its operation.

- You may charge the battery cartridge with the optional CU-301/321/311 communication unit or optional CH-351/CH-201 charger. For the charging procedure using the CU-301/321/311, refer to Chapter 5. For that using the CH-351/CH-201, refer to the "CH-351 User's Manual"/"CH-201 User's Manual."

- If the "Replace the batteries!" or "Charge the battery!" message appears after the BHT undergoes any shock or impact, turn the BHT off and on and then check the battery output level. The battery may not have run out.

| ⚠ WARNING | Only use the dedicated charger (CU-301/321/311 or CH-351/CH-201) for charging the rechargeable battery cartridge. | ❗ |
| --- | --- | --- |
| | Using a different type of charger could cause battery-rupture or leakage of battery fluid and result in a fire, bodily injury, or serious damage to property. | |

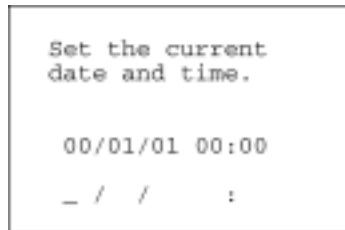| ⚠ CAUTION | Never charge a wet or damp battery cartridge. | 🚫 |
| --- | --- | --- |
| | Doing so could cause the batteries to break, generate heat, rupture or burn. | |

## 2.3.2   Setting-up 2: Setting the Calendar Clock

Turn the BHT on by pressing the **PW** key.

The following message appears.

```
Set the current
date and time.


00/01/01 00:00

_ /  /      :
```

In the following cases, the above message appears. In such instances, it is necessary to set the date and time. (The indication "00/01/01 00:00" will differ depending upon the calendar clock state.)
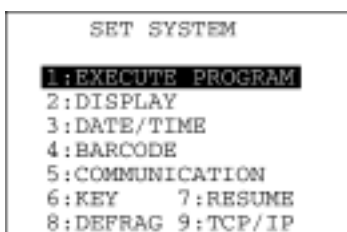
• The BHT is first turned on from the time of purchase.

• The BHT is turned on after the memory backup power source is completely discharged.

NOTE   It is recommended that you upload font files beforehand for such cases that you would mistakenly delete font files or a memory storage error would cause font files to be erased.

```
SYSTEM MENU

1:EXECUTE PROGRAM
2:DOWNLOAD
3:UPLOAD
4:SET SYSTEM
5:TEST
6:VERSION
7:FTP
```

(1) While holding down the **SF** and **1** keys, press the **PW** key to start System Mode. The SYSTEM MENU shown at left will appear.

```
SET SYSTEM

1:EXECUTE PROGRAM
2:DISPLAY
3:DATE/TIME
4:BARCODE
5:COMMUNICATION
6:KEY     7:RESUME
8:DEFRAG 9:TCP/IP
```

(2) On the SYSTEM MENU, press the **4** key to select the "SET SYSTEM" and press the **ENT** key. The screen shown at left will appear. (To return to the immediately preceding screen during this setting procedure, press the **C** key.)

```
    SET DATE/TIME

  00/01/01  00:00

  _ /  /      :
```
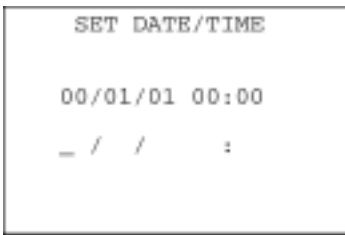
(3) On the SET SYSTEM screen, press the **3** key to select the "DATE/TIME" and then press the **ENT** key. The screen shown at left will appear.

(4) Use the numerical keys to enter the year (only the last two digits), month, day, hour, and minute in this order. If the data is in a single digit, add a 0 (zero) preceding the data.

NOTE   For the year, be sure to enter the last two digits of the year. For the hour, enter it in the 24-hour format.

If any of the year, month, day, hour, and minute is not entered, the **ENT** key will be deactivated.

If you make a wrong entry, press the **BS** key to delete it and then enter the correct data.

```
    SET DATE/TIME

  00/01/01  00:00

  04/01/19  16:00_
```

[Example] To set 2004, January 19, at 4:00 p.m.

Press **0** , **4** , **0** , **1** , **1** , **9** , **1** , **6** , **0** , and **0**.

```
    SET DATE/TIME

  04/01/19  16:00

  _ /  /      :
```

(5) Press the **ENT** key to register the above setting.

(6) Press the **C** key to return to the SET SYSTEM screen.

21

## 2.3.3 Adjusting the LCD Contrast & Beeper Volume and Switching the Beeper & Vibrator

While holding down the **M1** or **M4** key (right-hand trigger switch), press the **PW** key, and any of the following screens will appear on the LCD. This screen will disappear if you press the **ENT** key or no keys for five seconds.

When the beeper is selected (default)

```
LCD CONTRAST
         ██████ │      │

BEEPER

BEEPER VOLUME
         ████████
```
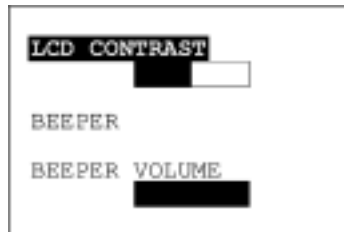
When the vibrator is selected

```
LCD CONTRAST
   ██████ │      │

         VIBRATION
```
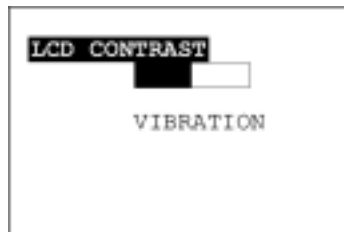
When both the beeper and vibrator are selected

```
LCD CONTRAST
      ██████ │      │

BEEPER VIBRATION

BEEPER VOLUME
      ████████
```
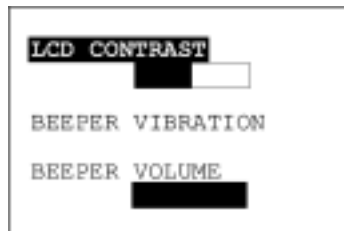
(The current selection is highlighted.)

22

## Adjusting the LCD contrast

You can adjust the LCD brightness to eight contrast levels.

(1)  Use the **F5** and **F6** keys to select the LCD CONTRAST line.

(2)  To decrease the contrast, press the **F7** key; to increase it, press the **F8** key.

## Switching the beeper & vibrator

You can choose any of three ways—beeping only, vibrating only, or beeping & vibrating as a confirmation of completion of bar-code reading.

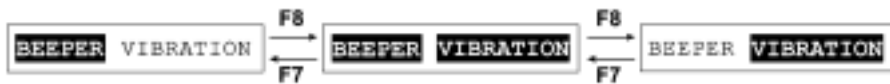(1)  Use the **F5** and **F6** keys to select the BEEPER VIBRATION line that will be highlighted in any one of the following three states:



(2)  Highlight the desired way(s) by using the **F7** and **F8** keys.

## Adjusting the beeper volume

You can adjust the beeper volume to four levels--High, Medium, Low, and OFF.

(1)  Use the **F5** and **F6** keys to select the BEEPER VOLUME line.

(2)  To turn down the volume, press the **F7** key; to turn it up, press the **F8** key.

After making the above setting, press the **ENT** key or no key for five seconds. The new setting will be fixed and the above screen will disappear.

## 2.3.4 Displaying the Battery Voltage Level and System Status

### [ 1 ]  Displaying the Battery Voltage Level

On the SYSTEM MENU or during execution of user programs, pressing the **ENT** key while holding down the **SF** key will display the battery voltage level.

As long as you hold down those keys, the following screen is displayed.

```
Battery Voltage

■■■■■□□□□□
```
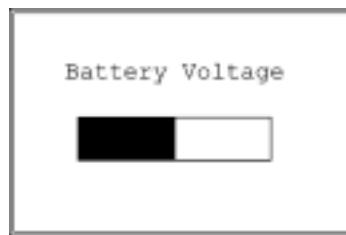
**NOTE**
• If the BHT is placed in the alphanumeric entry system in user programs, the combination of the **SF** and **ENT** keys cannot be used for displaying the battery voltage level. This is because in the alphanumeric entry system the **SF** key is used for switching between the numeric and alphabet entry modes as described in [ 2 ] below.

**TIP**
• In user programs, you may select the key to be used for displaying the battery voltage level (instead of the default: combination of **SF** and **ENT** keys).

• The displayed battery level shows the terminal voltage of the battery, not how much power is left. The actual voltage level varies depending upon the operation of the BHT, so the displayed level also may vary.

### [ 2 ]  Displaying the System Status

The BHT can display the system status--shift state of the keys, alphabet entry mode and communications link with the CU-311 on the bottom line of the LCD, using the icons shown below. For those icons, refer to the next page.

Shift state of the keys
Alphabet entry mode
Communications link with the CU-311
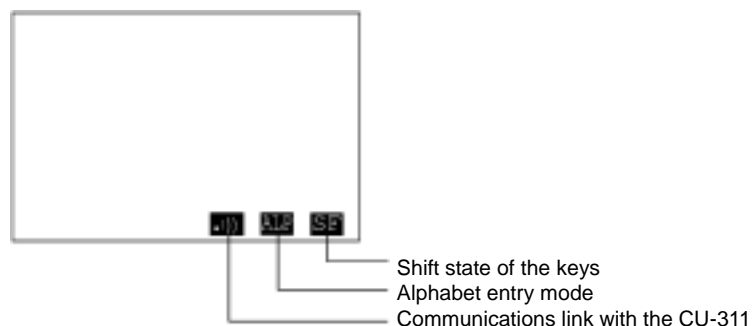
**TIP**
You may select whether or not to display the system status in SYSTEM MENU (refer to Section 2.5.3, [4.2]) or in user programs. The default is to display the system status.

Shift state of the keys

Pressing the **SF** key will shift the keys and show the icon ▣▣ in the right bottom corner of the LCD.

Alphabet entry mode

If the alphanumeric entry system has been selected in user programs, pressing the **SF** key will switch from the numeric entry mode to alphabet entry mode and show the icon ▣▣.

Communications link with the CU-311 (in LAN-support software only)

- When the communications device is closed or the communications link has not been established with the CU-311, no communications link icon appears.

- When the communications link is established with the CU-311, the icon ▣ appears.

- When the BHT tries to communicate with the CU-311 that has not been linked with the BHT, the icon ▣ flashes.

- When the BHT receives no response from the CU-311 or when it is waiting for the link to be established with or released from the CU-311, the three icons appear cyclically as shown below.
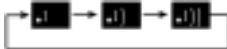
## 2.3.5 Battery Replacement Notes

### ■ When is battery replacement needed?

If the "Charge the battery!" appears on the LCD, replace the battery cartridge with a fully charged one.

If you leave the BHT without replacing the battery cartridge, the integrated calendar clock or data will no longer be backed up so that the calendar clock will stop or the message "Contact your administrator. Note the error number. (XXXX)" will appear on the LCD.

NOTE  Be sure to turn the BHT off before replacing the battery cartridge.

Replace the battery cartridge quickly. Load a charged battery cartridge within 3 minutes after the removal in order to avoid data loss.

After replacement, be sure to turn the BHT on and check its operation.

### ■ If you will use the BHT more than one time per month:

Keep the battery cartridge loaded in the BHT.

### ■ If you will not be using the BHT for more than one month:

Remove the battery cartridge from the BHT and then store the BHT. When doing so, be sure to follow the procedure given below.

**(1) When removing the battery cartridge:**

Hold down the **PW** key for more than 3 seconds to turn the BHT off.

The following message will appear on the LCD and the BHT will start backing up data. After completion of the backup operation so that the message disappears, remove the battery cartridge.

(The backup operation may take several tens of seconds depending upon the volume of data to be backed up.)

```
Now saving data.
Do not remove
batteries until
saving process
complete.
```
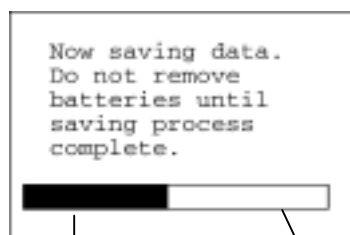
Shows the current backup state in progress.

Shows the total volume of data to be backed up.

**(2) When turning the BHT on after storage without a battery cartridge loaded:**

Even after the removal of the battery cartridge, the calendar clock will work with the backup power source for a while.

If the calendar clock backup has stopped, loading the battery cartridge and turning the BHT on will display the following message, prompting you to set the current date and time.

Set the calendar clock according to the procedure given in Section 2.3.2.

(The indication "00/01/01 00:00" will vary depending upon the calendar clock state.)

```
Set the current
date and time.


 00/01/01 00:00

 _ /  /      :
```
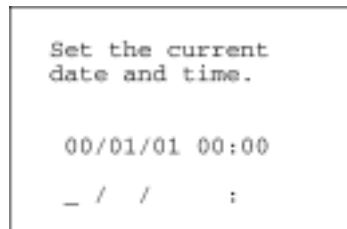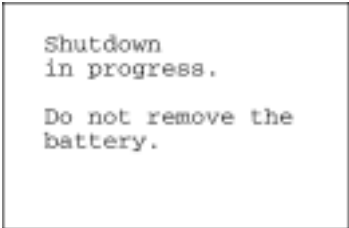
NOTE
- The rechargeable battery cartridge can be recharged hundreds of times, but it will eventually wear out. If the operation time of the fully recharged battery cartridge is noticeably shorter than normal, replace the battery cartridge with a new one.

- Use only DENSO WAVE-authorized battery cartridges and chargers.

- Never dispose of battery cartridges into a fire.

- Battery cartridges should be recycled properly in conformity with local codes and regulations. Do not throw them in a trash. Cover their terminal pins with vinyl tape to prevent short-circuits.

## 2.3.6  BHT Turning-off Notes

### [ 1 ]  "Shutdown in progress" message

When the BHT is turned off by pressing the **PW** key or by the auto power-off feature, it displays the following message and starts preparation for shutdown.

```
Shutdown
in progress.

Do not remove the
battery.
```

When the above message is displayed, do not remove the battery cartridge.
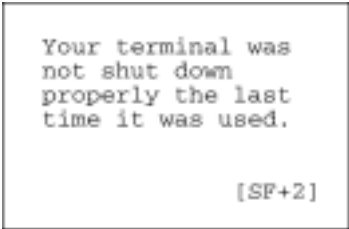
If you do so and leave the BHT without a battery cartridge loaded for one hour or more, then the error message "Contact your administrator. Note the error number. (20XX)" may appear when turning the BHT on at the next time.

### [ 2 ]  If the BHT is shut down abnormally

If the BHT is shut down abnormally* and is left without a battery cartridge or with a discharged battery cartridge loaded, then unsaved data may be lost.

(*"Normally shut down" refers to "turned off with the **PW** key or by the auto power-off feature.")

If the above problem has arisen, the following message will appear when you load a charged battery cartridge and turn the BHT on.

```
Your terminal was
not shut down
properly the last
time it was used.


                [SF+2]
```

(1)  Press the **2** key while holding down the **SF** key. The screen will switch to the following:

```
Unsaved data
        was lost.


                [SF+2]
```

(2)  Press the **2** key while holding down the **SF** key again. The screen will switch to the following:

```
Do you want to
    run Scandisk?

   1.Yes    2.No
```

    [1] YES:  Run Scandisk and start the System.

    [2] NO:    Turn the BHT off.

(3)  Choose YES or NO with the numerical keys and press the **ENT** key.

    When Scandisk is in progress, the following message is displayed:

```
Scandisk is
checking your
drive for errors.
```

    If Scandisk finds an invalid file(s), the following screen will appear. As long as an invalid file exits, the screen displays every time the BHT System is started up.

```
Scandisk found
    invalid files.

                [SF+2]
```

(4)  Press the **2** key while holding down the **SF** key. The screen will switch to the following:

```
Refer to the file
"$$BRKLST.SYS" for
more information.
```

(5)  Press the **ENT** key to start up the BHT System.

■ **Scandisk when the resume function is enabled**

If Scandisk runs when the resume function is enabled, the screen given below may appear. The screen may also appear when the calendar clock built in the BHT stops, even without running Scandisk.

The BHT displays the screen for three seconds and then automatically runs the execution program from the beginning.

```
No resume info.
has been retained.
Program restarts
    automatically.
```

# [ 3 ]   About "$$BRKLST.SYS"
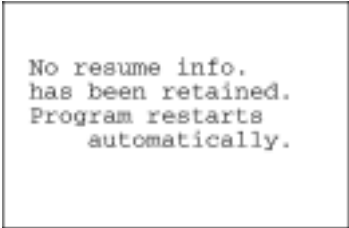
If Scandisk finds an invalid file(s), it will automatically create the "$$BRKLST.SYS" file. To check the contents of the file, upload the file in System Mode to the host PC. (Refer to Section 2.5.3, "[ 3 ] Uploading.")

## Contents of the "$$BRKLST.SYS" file

Records   (1) File name

      (2) Error factor    + (Broken since the BHT has not been turned off normally)
                          * (Broken due to any other causes)

      (3) Broken records  e.g. 01000-01200 (Data in records numbered 1000 to 1200 is lost)

(Example)

SAMPLE1.DAT + 01000-01050 ⎤  If more than one sequence of records is broken in a same file, they
SAMPLE1.DAT + 01200-01250 ⎬  will be written into the subsequent records in the
SAMPLE1.DAT + 01600-01650 ⎦  "$$BRKLST.SYS."
SAMPLE2.DAT * 00250-00275
SAMPLE3.DAT * 00100-00150

    (1)      (2)    (3)

# [ 4 ]   If invalid files are found

Even invalid files can be uploaded, so upload them to the host PC according to your needs.

After uploading,

- Delete those invalid files. (Refer to Section 2.5.3, "[ 8 ] Deleting Files.")

  or

- Download valid files having the same names as invalid ones. (Refer to Section 2.5.3, "[ 2 ] Downloading.")

# 2.4　Initializing the BHT System
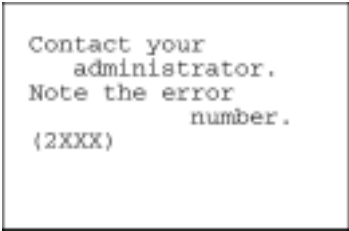
Initializing the system will lose program files and data files stored in the user area and make system settings revert to the factory defaults.

TIP　You can delete font files by selecting the whole user area to be initialized.

You need to initialize the system if:

(1)　You want to delete all of the program files and data files.

(2)　The following message appears when the BHT is turned on.

```
Contact your
     administrator.
Note the error
               number.
(2XXX)
```

On the following pages is an initialization procedure.

(1)  Selecting the memory area to be initialized

```
INITIALIZE SYSTEM

1:USER AREA EXCEPT
  FONTS
```
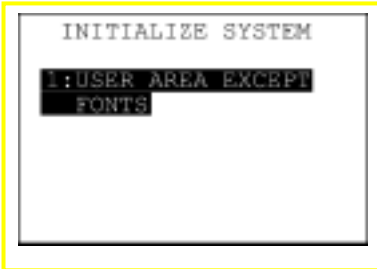
Press the **PW** key while holding down the **SF**, **M1** and **0** keys together.

The screen shown at left will appear.

To initialize the user area except for the font file area, press the **ENT** key. The screen switches to the confirmation display given in step (3) below.

To initialize the whole user area including the font file area, press the **2** key while holding down the **SF** key. The "2:WHOLE USER AREA" item will appear.

(Area selection screen)

```
INITIALIZE SYSTEM

1:USER AREA EXCEPT
  FONTS

2:WHOLE USER AREA
```
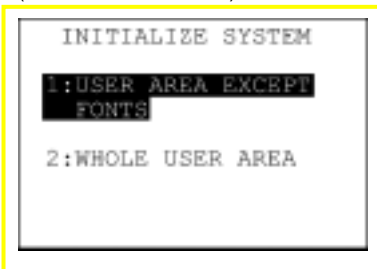
[1] USER AREA EXCEPT FONTS:
        Initializes the user area except for the font file area.

[2] WHOLE USER AREA:
        Initializes the whole user area including the font file area.

TIP  If the message "Contact your administrator. Note the error number. (2XXX)" appears on the LCD, you need to select "2: WHOLE USER AREA" to initialize the whole user area.

Select an area to be initialized by using the numerical keys, then press the **ENT** key. The screen switches to the SELECT MESSAGE display given in step (2).

(2)  Selecting the English or Japanese message version

```
SELECT MESSAGE

  1:Japanese

  2:English
```

Preceding the execution of initialization, the message version selection screen will appear as shown at left.

[1] Japanese:    Switches the message version to Japanese.

[2] English:    Switches the message version to English.

Select a desired item by using the numerical keys, then press the **ENT** key.

NOTE  If there is no system message file in the BHT, selecting "1:Japanese" cannot switch to the Japanese message version. The English version applies instead.

(3) Confirming the memory area selected for initialization

```
INITIALIZE SYSTEM

      OK?
   1:Yes  2:No
```
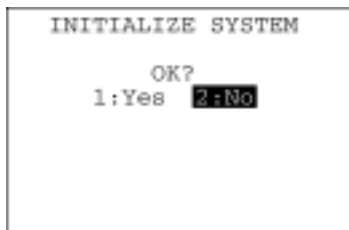
Selecting the "USER AREA EXCEPT FONTS" in step (1) above will call up the confirmation screen shown at left.

[1] Yes:  Starts initialization.

[2] No:  Cancels initialization and turns the power off.

Select a desired item by using the numerical keys, then press the **ENT** key.

Pressing the **C** key will switch the screen back to the area selection screen.

```
INITIALIZE SYSTEM

      OK?
   1:Yes  2:No
Warning
Initializing the
whole user area will
lose the font files.
```
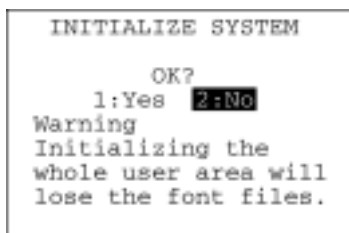
Selecting the "WHOLE USER AREA" in step (1) above will call up the screen shown at left.

[1] Yes :  Starts initialization.

[2] No :  Cancels initialization and turns the power off.

Select a desired item by using the numerical keys, then press the **ENT** key.

Pressing the **C** key will switch the screen back to the area selection screen.

(4) During initialization

```
INITIALIZE SYSTEM

 ** Initializing **


[■■■■■■■        ]
```
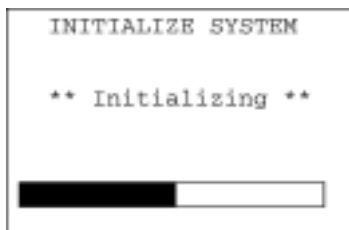
During initialization, the screen shown at left is displayed.

(5)  Completion of initialization

```
INITIALIZE SYSTEM


  ** Completed **



```
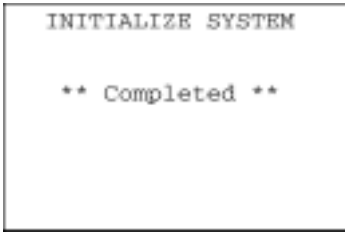
Upon completion of the initialization, the BHT displays the screen shown at left for a second and turns itself off automatically.

NOTE
- Do not turn the BHT off until the above initialization completion screen appears. A too-early turning-off will interrupt initialization, requiring you to initialize the BHT again.

- If the message "Contact your administrator. Note the error number. (2XXX)" appears although the initialization has been finished, you need to initialize the BHT again.

- If you initialize the BHT after downloading user programs and data, all of those programs and data stored in the target memory area will be lost. Download them again if necessary.

- Initialization will restore the LCD contrast level (refer to Section 2.3.3), communications conditions and other settings to the default values, so modify them again if necessary. After initialization, be sure to set the calendar clock (refer to Section 2.3.2).

# 2.5   Operating in System Mode

System Mode is an operating software exclusively designed for the effective use of the BHT, which includes various functions as shown on the following pages.

## 2.5.1   Starting System Mode

To start up System Mode, turn the BHT on while holding down the **SF** and **1** keys. This operation calls up the SYSTEM MENU on the LCD as shown below.

```
          SYSTEM MENU

    1:EXECUTE PROGRAM
    2:DOWNLOAD
    3:UPLOAD
    4:SET SYSTEM
    5:TEST
    6:VERSION
    7:FTP
```
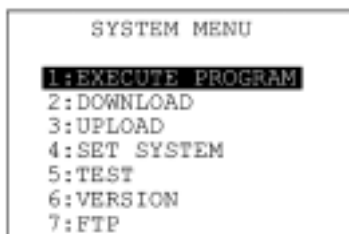
The function selected is highlighted (white-on-black) with the cursor. To select a desired item in System Mode, press the corresponding numerical key and then press the **ENT** key.

The keys below are so designed that the function of each key is consistent in every screen.

| | |
|---|---|
| Numerical keys | Pressing a numerical key corresponding with a desired menu number selects the desired item displayed on the screen. |
| **ENT** key | Pressing this key registers the selected item and executes the corresponding function. |
| **F5** and **F6** keys | Pressing the **F5** and **F6** keys moves the cursor up and down, respectively, to select a desired item. |
| **F7** and **F8** keys | Pressing the **F7** and **F8** keys moves the cursor to the left and right, respectively, to select a desired setting. |

The **C** key is disabled on the SYSTEM MENU. On other screens, pressing the **C** key returns to the immediately preceding screen.

The power-on default on the SYSTEM MENU is "EXECUTE PROGRAM" which is highlighted. Once any other item is selected, the selected item will become highlighted with the cursor when you turn back to the SYSTEM MENU.

NOTE    On BHTs with no LAN-support software loaded, selecting LAN-related items (e.g., FTP and TCP/IP setting) produces nothing.

## ■ **Structure of System Mode**

```
    SYSTEM MENU

1:EXECUTE PROGRAM
2:DOWNLOAD
3:UPLOAD
4:SET SYSTEM
5:TEST
6:VERSION
7:FTP
```

**SYSTEM MENU** ← Press the **PW** key while holding down the **SF** and **1** keys.

**C** key

**1** and **ENT** keys

```
  EXECUTE PROGRAM

SAMPLE01.PD4
SAMPLE02.PD4
SAMPLE03.PD4
SAMPLE04.PD4
SAMPLE05.PD4
SAMPLE06.PD4
```
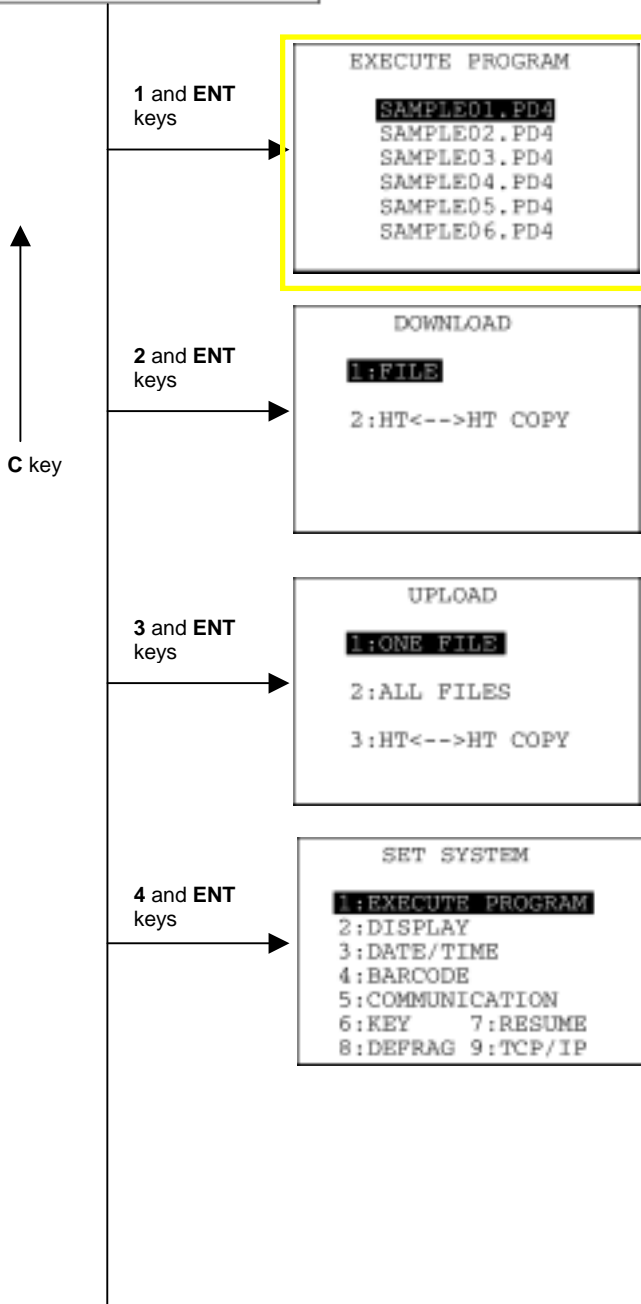
**Program Execution**

Allows you to select a desired user program to be executed immediately.

(Refer to Section 2.5.3, [ 1 ].)

**2** and **ENT** keys

```
      DOWNLOAD

1:FILE

2:HT<-->HT COPY
```

**Downloading**

Transfers user program files or data files from the host PC to the memory integrated in the BHT. Downloading between the BHTs is also possible.

(Refer to Section 2.5.3, [ 2 ].)

**3** and **ENT** keys

```
       UPLOAD

1:ONE FILE

2:ALL FILES

3:HT<-->HT COPY
```

**Uploading**

Transfers user program files and data files stored in the memory of the BHT to the host PC.

(Refer to Section 2.5.3, [ 3 ].)

**4** and **ENT** keys

```
     SET SYSTEM

1:EXECUTE PROGRAM
2:DISPLAY
3:DATE/TIME
4:BARCODE
5:COMMUNICATION
6:KEY    7:RESUME
8:DEFRAG 9:TCP/IP
```

**System Environment Setting**

Sets a variety of environmental conditions--an execution program, message version (English or Japanese), system status indication, BHT-5000 screen compatibility mode, calendar clock, special bar-code scanning parameters, interface port, communications parameters, shift key & magic key functions, resume function, drive defragmentation, and TCP/IP, FTP and DHCP settings (in LAN-support software only).

(Refer to Section 2.5.3, [ 4 ].)

**5** and **ENT** keys

```
          TEST

    1:BARCODE  2:MEMORY
    3:BEEPER   4:AGING
    5:LCD      6:FILE
    7:COMMUNICATION
    8:KEY & VIBRATION
    9:PING
```
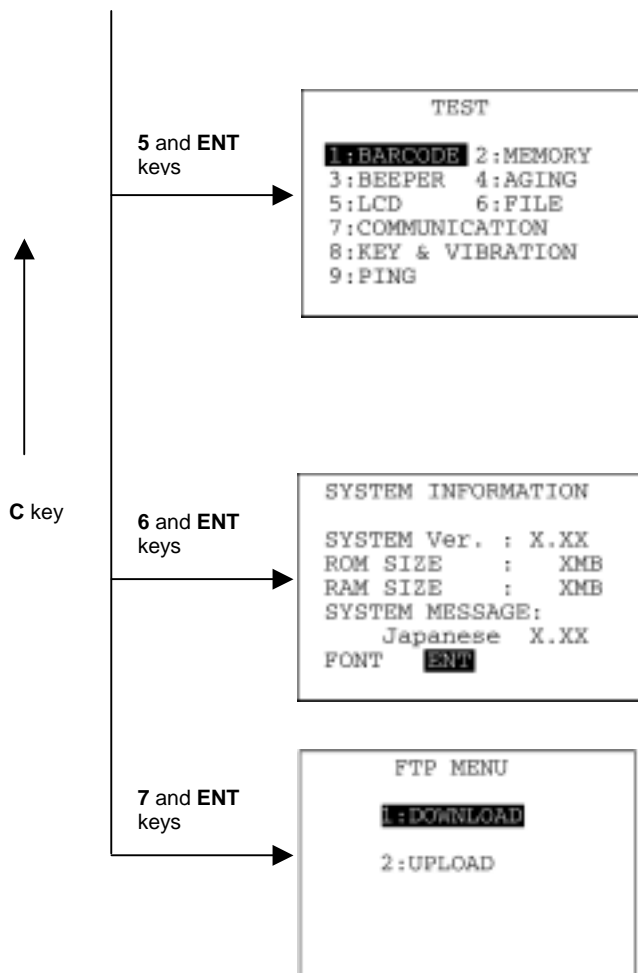
**Testing**

Used for the bar-code reading test, memory test, beeper test, aging test, LCD indication test, indicator LED test, file test, communications test, key-entry test, vibrator test, and execution of PING (in LAN-support software only).

(Refer to Section 2.5.3, [ 5 ].)

**C** key

**6** and **ENT** keys

```
    SYSTEM INFORMATION

    SYSTEM Ver. : X.XX
    ROM SIZE    :    XMB
    RAM SIZE    :    XMB
    SYSTEM MESSAGE:
        Japanese  X.XX
    FONT    ENT
```

**System Information**

Shows the system program version, ROM and RAM sizes, system message version, and font type and its version.

(Refer to Section 2.5.3, [ 6 ].)

**7** and **ENT** keys

```
        FTP MENU

    1:DOWNLOAD

    2:UPLOAD
```

**Downloading/Uploading by FTP** (in LAN-support software only)

Downloads or uploads files by FTP.

(Refer to Section 2.5.3, [ 7 ].)

38

In addition to the functions given on the preceding pages, System Mode has these six functions: Deleting program/data files, Deleting font files, Downloading/uploading the BHT system parameter file, Setting the remote wakeup parameters, Downloading/uploading the system message file, and Updating the systems.

To call up these functions, press the **0**, **2**, **3**, **4**, **6** or, period (.) key, respectively, while holding down the **SF** key when the SYSTEM MENU is displayed.

```
  SYSTEM MENU

1:EXECUTE PROGRAM
2:DOWNLOAD
3:UPLOAD
4:SET SYSTEM
5:TEST
6:VERSION
7:FTP
```

**SYSTEM MENU** ← Press the **PW** key while holding down the **SF** and **1** keys.

**0** with **SF** held down

```
    DELETE FILE

SAMPLE01.PD4
SAMPLE02.PD4
SAMPLE03.PD4
SAMPLE04.PD4
SAMPLE05.PD4
SAMPLE06.PD4
```

**Deleting program/data files**

Deletes a program file or data file stored in the memory.

(Refer to Section 2.5.3, [ 8 ].)

**2** with **SF** held down

```
    DELETE FILE

FNT16J1.FN3
FNT16J2.FN3
FNT12J1.FN3
FNT12J2.FN3
```

**Deleting font files**

Deletes a font file stored in the memory.

(Refer to Section 2.5.3, [ 9 ].)

**3** with **SF** held down

```
  SYSTEM PARAMETER

1:DOWNLOAD

2:UPLOAD
```

**Downloading/uploading the BHT system parameter file**

Downloads or uploads the system parameter file.

(Refer to Section 2.5.3, [ 10 ].)

**C** key

**4** with **SF** held down

```
  SET REMOTE WAKEUP

1:REMOTE WAKEUP
    ON      OFF

2:TRANSMIT SPEED
   9600   19200 38400
  57600  115200
```

**Setting the remote wakeup**

Sets the remote wakeup parameters.

(Refer to Section 2.5.3, [ 11 ].)

**C** key

**6** with **SF** held down

```
SYSTEM MESSAGE

1:DOWNLOAD

2:UPLOAD
```

Period (.) with **SF** held down

```
MODIFY MENU

1:SYSTEM MODIFY

2:CU-F/W MODIFY
```

**Downloading/uploading the system message file**

Downloads or uploads the system message file.

(Refer to Section 2.5.3, [ 12 ].)

**Updating the Systems**

Updates the BHT system and CU-311 system (in LAN-support software only).

(Refer to Section 2.5.3, [ 13 ].)
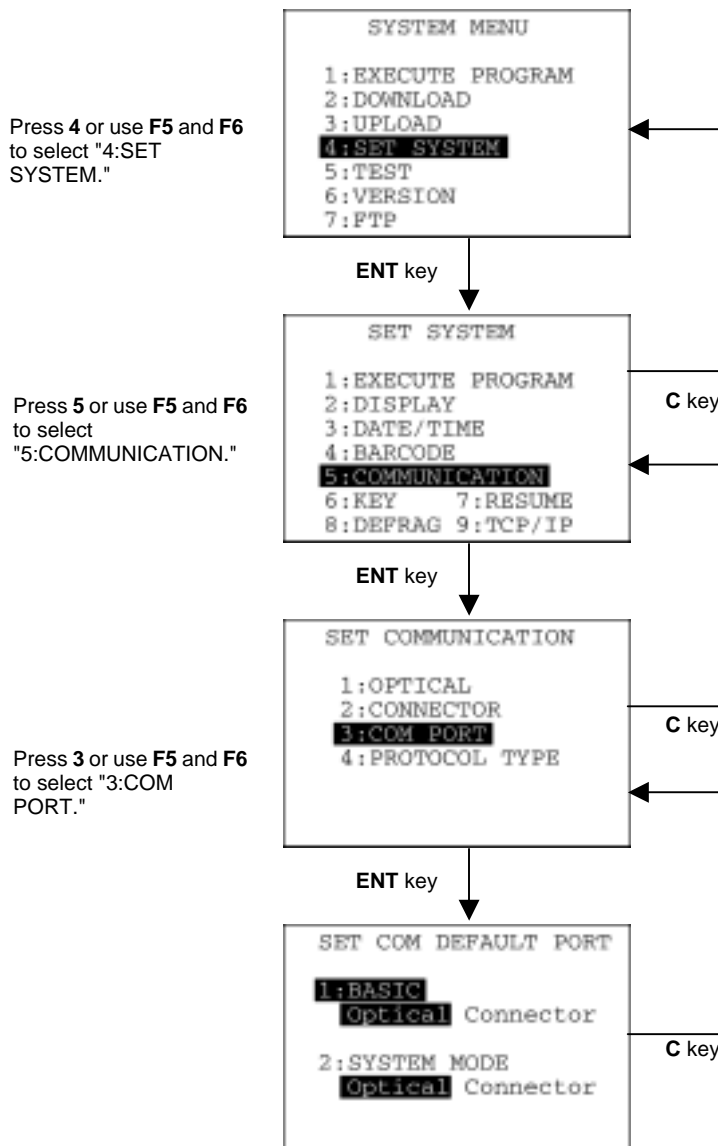
## 2.5.2    Operating in System Mode

Some functions in System Mode require several screens to be shifted, as shown in the example below.

### [ 1 ]    Calling up the desired set screen

First, select a desired item on the current screen by using the numerical key or the cursor keys (**F5** and **F6**) so as to highlight the desired item.

Press the **ENT** key to establish the selected item and proceed to the subsequent screen.

To return to the preceding screen, press the **C** key.

Press **4** or use **F5** and **F6** to select "4:SET SYSTEM."

```
       SYSTEM MENU

  1:EXECUTE PROGRAM
  2:DOWNLOAD
  3:UPLOAD
  4:SET SYSTEM
  5:TEST
  6:VERSION
  7:FTP
```

**ENT** key

**C** key

Press **5** or use **F5** and **F6** to select "5:COMMUNICATION."

```
       SET SYSTEM

  1:EXECUTE PROGRAM
  2:DISPLAY
  3:DATE/TIME
  4:BARCODE
  5:COMMUNICATION
  6:KEY     7:RESUME
  8:DEFRAG 9:TCP/IP
```

**ENT** key

```
    SET COMMUNICATION

     1:OPTICAL
     2:CONNECTOR
     3:COM PORT
     4:PROTOCOL TYPE
```

**C** key

Press **3** or use **F5** and **F6** to select "3:COM PORT."

**ENT** key

```
  SET COM DEFAULT PORT

  1:BASIC
     Optical Connector

  2:SYSTEM MODE
     Optical Connector
```

**C** key

41

# [ 2 ]   Selecting a desired setting

First, select a desired item on the current screen by using the numerical key or the cursor keys (**F5** and **F6**) so as to highlight the desired item.

Use the **F7** and **F8** keys to select a desired setting and then press the **ENT** key. The screen returns to the previous selection screen.

```
SET COM DEFAULT PORT

1:BASIC
   Optical Connector

2:SYSTEM MODE
   Optical Connector
```

Press **2** key or use **F5** and **F6** keys
to select the desired set item.

```
SET COM DEFAULT PORT

1:BASIC
   Optical Connector

2:SYSTEM MODE
   Optical Connector
```

Use **F7** and **F8** keys to select the
desired setting.

```
SET COM DEFAULT PORT

1:BASIC
   Optical Connector

2:SYSTEM MODE
   Optical Connector
```

**ENT** key

```
SET COMMUNICATION

   1:OPTICAL
   2:CONNECTOR
   3:COM PORT
   4:PROTOCOL TYPE
```

# 2.5.3   Detailed Description of the Functions in System Mode

## [ 1 ]   Program Execution

```
EXECUTE PROGRAM

SAMPLE01.PD4
SAMPLE02.PD4
SAMPLE03.PD4
SAMPLE04.PD4
SAMPLE05.PD4
SAMPLE06.PD4
```

On the SYSTEM MENU, selecting "1:EXECUTE PROGRAM" calls up the screen shown at left.

If more than one program has been downloaded to the user area of the target memory, use the **F5** and **F6** keys to move the cursor to a target program, and then press the **ENT** key.

To return to the SYSTEM MENU, press the **C** key.

```
EXECUTE PROGRAM

SAMPLE01.PD4
SAMPLE02.PD4
SAMPLE03.PD4
SAMPLE04.PD4
SAMPLE05.PD4
SAMPLE06.PD4
```

If more than six programs have been downloaded, you may need to scroll the screen with the **F6** key.

⇓

```
EXECUTE PROGRAM

SAMPLE02.PD4
SAMPLE03.PD4
SAMPLE04.PD4
SAMPLE05.PD4
SAMPLE06.PD4
SAMPLE07.PD4
```

⇓

```
EXECUTE PROGRAM

SAMPLE18.PD4
SAMPLE19.PD4
SAMPLE20.PD4
SAMPLE21.PD4
SAMPLE22.PD4
SAMPLE23.PD4
```

In the example shown at left, 23 programs are downloaded.

```
EXECUTE PROGRAM

******************
* NO FILE EXISTS *
******************
```

If no program file is downloaded in the memory, the message shown at left will appear.

To return to the SYSTEM MENU, press the **C** key.

43

# [ 2 ]  Downloading

NOTE If you download a file having the same name as one already used in the user area of the target memory in the BHT, then the newly downloaded file replaces the old one.

NOTE If no auto-start executable program has been specified (in Section 2.5.3, [4.1]), turning the BHT on lets the directory manager start the first loaded one out of user programs (.PD4) in the BHT--the program that appears on the top of the EXECUTE PROGRAM menu shown on the previous page. Taking this into account, determine the file downloading order. For details, refer to Section 2.7, "Starting Up User Programs."

```
   DOWNLOAD

 1:FILE

 2:HT<-->HT COPY
```

On the SYSTEM MENU, selecting "2: DOWNLOAD calls up the screen shown at left.

[1] FILE: Downloads a user program file or data file to the user area of the BHT.

[2] HT<-->HT COPY: Downloads all of the files, system parameters, and calendar clock data stored in the connected BHT.

This function enables copying between the BHTs.

For the preparation to be made preceding the start of this function, refer to NOTE below.

Select a desired item by using the numerical keys or **F5** and **F6** keys, and the selected item becomes highlighted. Then press the **ENT** key.

To return to the SYSTEM MENU, press the **C** key.

NOTE Preparation for Copying between the BHTs

Before downloading to the BHT from another BHT, make the following preparation:

• At each BHT, set the interface port. The default is an IrDA interface (Optical).

   Interface setting procedure: Starting on the SYSTEM MENU, select "4:SET SYSTEM," "5:COMMUNICATION," and "3:COM PORT." On the SET COM DEFAULT PORT screen, select the IrDA interface (Optical) or direct-connect interface (Connector) of "2:SYSTEM MODE."

• At each BHT, set the FIELD SPACE to "Ignore" on the communications protocol option screen to trim trailing spaces in data fields. The default is "Ignore." For the setting procedure, refer to Section 2.5.3, [4.5].

• When using the direct-connect interface, pull out the connector cover on each BHT to expose the direct-connect interface port. Connect the BHTs via those ports with the direct-connect interface cable (having 3-pole mini stereo plugs). For the details about the cable, refer to Chapter 3, Section 3.2.

• On the uploading BHT, run System Mode and select "3:UPLOAD" and "3:HT<-->HT COPY."

**TIP** **Data that can be copied from one BHT to another BHT**

The copying function between BHTs copies the following set data:

---

LCD contrast level

Beeper volume

Switching between beeper and vibrator

Execution program to be run automatically when the BHT is turned on

Message version (English or Japanese)

---

Display font size

System status display

Date

Time

Setting of black-and-white inverted label reading function

---

Decode level

Minimum number of digits to be read for ITF

Minimum number of digits to be read for STF

Minimum number of digits to be read for Codabar (NW-7)

Interface port to be used in user programs

---

Interface port to be used in System Mode

Communications parameters for the IrDA interface

Communications parameters for the direct-connect interface

Communications protocol options for the IrDA interface

Communications protocol options for the direct-connect interface

---

Communications protocol type

Shift key function defined

M1 key function defined

M2 key function defined

M3 key function defined

---

M4 key function defined

Resume function

Remote wakeup setting (enable/disable)

Transmission speed for remote wakeup

Remote wakeup history

---

BHT-5000 screen compatibility mode

YMODEM option

IP address of FTP server

User name of FTP server

Password of FTP server

Default directory for FTP server

FTP option, Line delimiters (CR/LF)

FTP option, Treatment of line delimiters

FTP option, Treatment of trailing spaces in data fields

FTP option, Upload mode

FTP option, Verbose mode

IP address of host PC for ping

Data size of echo request

Echo request intervals

Timeout period for echo request

No. of echo requests to be sent

Echo request send timing

TCP/IP operation device

TCP/IP link layer

Transmission speed between BHT and CU

No. of retries for link establishment command to be sent

Link establishment command intervals

No. of retries for link release command to be sent

Link release command intervals

Link release period

Timeout for getting the IP configuration from the DHCP server

## Download screens

```
DOWNLOAD FILE


 ** Waiting **
```

With this screen displayed, the BHT waits for a file to be downloaded.

Selecting "2:HT<-->HT COPY" on the DOWNLOAD menu displays "HT<-->HT" in the center of the 2nd line; selecting "1:FILE" displays nothing on the 2nd line.

⇓

```
DOWNLOAD FILE


 ** Loading **
```

Upon start of BHT-BASIC4.0 Transfer Utility or equivalent program, the BHT displays the screen shown at left.

(Refer to the "BHT-BASIC4.0 Transfer Utility User's Guide.")

⇓

```
DOWNLOAD FILE

 XXXXXXXX.XXX
 ** Loading **

 XXXXX/YYYYY
```

While the downloading operation is in progress, the screen shown at left is displayed indicating the file name and the number of received records/the total number of records (the received file size/the total file size (in kilobytes) in transfer with YMODEM).

To abort the downloading operation, press the **C** key. The screen switches back to the DOWNLOAD menu.

⇓

```
DOWNLOAD FILE

 XXXXXXXX.XXX
 ** Completed **
```

Upon completion of downloading, the number of received records (or the received file size) becomes equal to the total number of records (or the total file size) and the beeper beeps once. Press the **C** key to return to the DOWNLOAD menu.

With this screen displayed on the BHT, downloading another new file from the host PC lets the BHT start receiving it.

(Refer to the "BHT-BASIC4.0 Transfer Utility User's Guide.")

If you have selected "2: HT<-->HT COPY" on the DOWNLOAD menu, a sequence of the above screens will be repeated by the number of files to be downloaded.

#### If an error occurs during downloading

If some error occurs during downloading, the BHT beeps three times and shows one of the following screens with the prompt "Retry?":

To retry the download, press the **1** and **ENT** keys; to abort it, press the **2** and **ENT** keys.

```
DOWNLOAD FILE

XXXXXXXX.XXX
Out of memory!!


Retry?
        1:Yes 2:No
```

■ **Problem**

The memory is insufficient for storing files to be downloaded.

■ **Solution**

Press the **2** key to return to the SYSTEM MENU, then delete unnecessary files in the memory or decrease the size of the file to be downloaded. (Refer to Section 2.5.3, [ 8 ] and [ 2 ].)

```
DOWNLOAD FILE

XXXXXXXX.XXX
Too many files!!


Retry?
        1:Yes 2:No
```

■ **Problem**

The current download will exceed the maximum of 120 files in the memory.

■ **Solution**

Press the **2** key to return to the SYSTEM MENU. Delete unnecessary files in memory or decrease the number of files to be downloaded if you attempted to download more than one file (Refer to Section 2.5.3, [ 8 ] and [ 2 ].)

```
DOWNLOAD FILE

XXXXXXXX.XXX
Communication error!!


Retry?
        1:Yes 2:No
```

■ **Problem**

Downloading has failed.

■ **Solution**

To retry downloading, press the **1** key.

To return to the SYSTEM MENU, press the **2** key. Check the interface port, communications parameters, and communications protocol in the SET SYSTEM menu or perform the communications test in the TEST menu. (Refer to Section 2.5.3, [4.5] and [5.7].)

It is also necessary to check the communications parameters setup of the host PC.

```
    DOWNLOAD FILE

    XXXXXXXX.XXX
  Program file error!!


  Retry?
        1:Yes 2:No
```

### ■ **Problem**

You attempted to download an invalid program file.

### ■ **Solution**

Check whether the program file you attempted to download is available to your BHT model. If it is not available, download the appropriate program.

# [ 3 ]   Uploading

```
        UPLOAD

  1:ONE FILE

  2:ALL FILES

  3:HT<-->HT COPY
```

On the SYSTEM MENU, selecting "3: UPLOAD" calls up the screen shown at left.

[1] ONE FILE:         Uploads a user program file or data file stored in the memory.

[2] ALL FILES:        Uploads all files in the memory except font files.

[3] HT<-->HT COPY:    Uploads all files in the memory except font files to another BHT, together with system parameters and calendar clock data.

                      This function enables copying between the BHTs. At the receiving BHT, select "2: DOWNLOAD" and "2: HT<-->HT COPY" in System Mode.

                      For the preparation to be made preceding the start of this function, refer to ▉▉ given on page 44.

Select a desired item by using the numerical keys or **F5** and **F6** keys, and the selected item becomes highlighted. Then press the **ENT** key.

To return to the SYSTEM MENU, press the **C** key.

```
      UPLOAD FILE

  SAMPLE01.PD4
  SAMPLE02.PD4
  SAMPLE03.PD4
  SAMPLE04.PD4
  SAMPLE05.PD4
  SAMPLE06.PD4
```
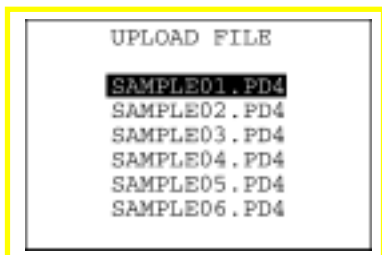
If you select "1: ONE FILE" on the UPLOAD menu, the file selection screen as shown at left appears, listing all of the program files and data files stored in the memory. Select a file(s) you want to upload and press the **ENT** key.

If you select "2: ALL FILES" or "3: HT<-->HT COPY" on the UPLOAD menu, the "ALL" or "HT<-->HT" will appear in the center of the 2nd line, respectively.

```
      UPLOAD FILE

  *****************
  * NO FILE EXISTS *
  *****************
```
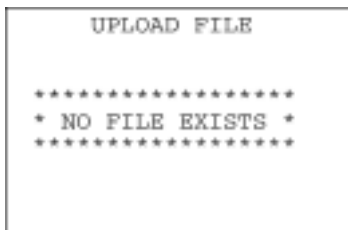
If you select "1: ONE FILE" or "2: ALL FILES" on the UPLOAD menu when no files are stored in the memory, the message shown at left appears.

Pressing the **C** key returns to the UPLOAD menu.

## Upload screens

```
    UPLOAD FILE


  ** Waiting **
```

If you select "1: ONE FILE" and choose a file to be uploaded or if you select the "2: ALL FILES" or "3:HT<-->HT COPY" on the UPLOAD menu, then the screen shown at left appears.

Selecting "2: ALL FILES" or "3: HT<-->HT COPY" displays "ALL" or "HT<-->HT" in the center of the 2nd line, respectively.

Showing this screen, the BHT waits for a file(s) to be uploaded.

⇓

```
    UPLOAD FILE


  ** Loading **
```

Upon start of BHT-BASIC4.0 Transfer Utility or equivalent program, the BHT displays the screen shown at left.

(Refer to the "BHT-BASIC4.0 Transfer Utility User's Guide.")

⇓

```
    UPLOAD FILE

  SAMPLE01.PD4
  ** Loading **

  XXXXX/YYYYY
```

While the uploading operation is in progress, the screen shown at left is displayed indicating the file name and the number of sent records/the total number of records (the sent file size/the total file size (in kilobytes) in transfer with YMODEM).

To abort the uploading operation, press the **C** key. The screen switches back to the UPLOAD menu.

⇓

```
    UPLOAD FILE

  SAMPLE01.PD4
  ** Completed **
```

Upon completion of uploading, the number of sent records (or the sent file size) becomes equal to the total number of records (or the total file size) and the beeper beeps once. Press the **C** key to return to the UPLOAD menu.

If you have selected "2: ALL FILES" or "3: HT<-->HT COPY" on the UPLOAD menu, a sequence of the above screens will be repeated by the number of files to be uploaded.

**If an error occurs during uploading**

If some error occurs during uploading, the BHT beeps three times and shows one of the following screens:

To retry the uploading operation, press the **1** and **ENT** keys; to abort it, press the **2** and **ENT** keys.

```
    UPLOAD FILE


   File error!!


Upload?
      1:Yes 2:No
```

■ **Problem**

The file you attempted to upload is damaged.

■ **Solution**

To upload the damaged file as is, press the **1** key.

```
    UPLOAD FILE

    XXXXXXXX.XXX
Communication error!!


Retry?
      1:Yes 2:No
```

■ **Problem**

Uploading has failed.

■ **Solution**

To retry uploading, press the **1** key.

To return to the SYSTEM MENU, press the **2** key. Check the interface port, communications parameters, and communications protocol in the SET SYSTEM menu or perform the communications test in the TEST menu. (Refer to Section 2.5.3, [4.5] and [5.7].)

It is also necessary to check the communications parameters setup of the host PC.

# [ 4 ]    System Environment Setting

```
      SET SYSTEM

1:EXECUTE PROGRAM
2:DISPLAY
3:DATE/TIME
4:BARCODE
5:COMMUNICATION
6:KEY     7:RESUME
8:DEFRAG 9:TCP/IP
```
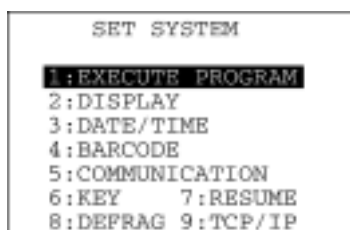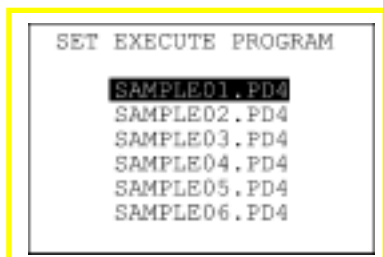
On the SYSTEM MENU, selecting "4: SET SYSTEM" calls up the screen shown at left.

[1] EXECUTE PROGRAM:    Sets an auto-start execution program to be run when the power is turned on.

[2] DISPLAY:    Sets the message version (English or Japanese).

[3] DATE/TIME:    Sets the calendar clock (date and time).

[4] BARCODE:    Sets the special barcode scanning parameters (the black-and-white inverted label reading and the decoding level) and the minimum number of digits to be read for bar codes (ITF, STF and Codabar).

[5] COMMUNICATION:    Sets the communications environments (interface port and communications parameters).

[6] KEY:    Defines the functions of the shift key and magic keys.

[7] RESUME:    Sets the resume function.

[8] DEFRAG:    Defragments the drive.

[9] TCP/IP:    Sets the TCP/IP, FTP and DHCP (in LAN-support software only).

Select a desired item by using the numerical keys or **F5** and **F6** keys, and the selected item becomes highlighted. Then press the **ENT** key.

Press the **C** key to return to the SYSTEM MENU.

53

## [4.1]   Setting an auto-start execution program

```
SET EXECUTE PROGRAM

  SAMPLE01.PD4
  SAMPLE02.PD4
  SAMPLE03.PD4
  SAMPLE04.PD4
  SAMPLE05.PD4
  SAMPLE06.PD4
```
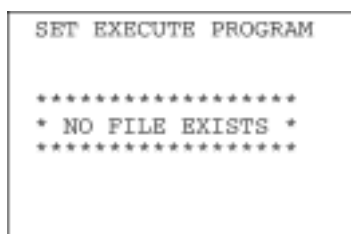
On the SET SYSTEM menu, selecting "1: EXECUTE PROGRAM" calls up the screen shown at left.

Highlighted is the current setting.

Use the **F5** and **F6** keys to move the cursor to a desired execution program to be run automatically when the power is applied, and then press the **ENT** key.

To return to the SET SYSTEM menu, press the **C** key.

```
SET EXECUTE PROGRAM



******************
* NO FILE EXISTS *
******************
```

If no program files are stored in the memory, the screen shown at left will appear.

To return to the SET SYSTEM menu, press the **C** key.

## [4.2]   Setting the message version, system status indication, and BHT-5000 screen compatibility mode

```
SET DISPLAY

1:MESSAGE

English Japanese

2:STATUS   ON  OFF
3:BHT-5000 ON  OFF
```

On the SET SYSTEM menu, selecting "2: DISPLAY" calls up the screen shown at left.

Highlighted is the current setting.

[1] MESSAGE:  Switches the message version to English or Japanese for system error messages and indications on the LCD contrast, beeper volume, beeper & vibrator switching, and battery voltage level screens. (The default is the message version that you selected in the initializing sequence.)

[2] STATUS:   Turns the system status indication on or off. Setting this to ON displays the shift state of the keys, alphabet entry mode and communications link with the CU-311, using the icons shown on the next page.

[3] BHT-5000:  Turns the BHT-5000 screen compatibility mode on or off. (See the next page.)

Select a desired item by using the numerical keys or **F5** and **F6** keys, then select a desired setting by using the **F7** and **F8** keys.
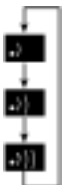
Press the **ENT** key.

To return to the SET SYSTEM menu, press the **C** key.

TIP   You can turn the system status indication on or off also by using the OUT statement in user programs. Refer to the "BHT-BASIC Programmer's Manual."

**STATUS (System Status Indication)**

Turning on the system status indication displays the following icons in the bottom line of the LCD:

| Indication | Icon | Description |
|---|---|---|
| Shift state of the keys | SF | Appears when the keys on the keypad are shifted. |
| Alphabet entry mode | ALP | Appears when the BHT is placed in the alphabet entry mode. (If the alphanumeric entry system has been selected in user programs, pressing the **SF** key will switch from the numeric entry mode to alphabet entry mode.) |
| Communications link with the CU-311 (in LAN-support software only) | | Appears when the communications link is established with the CU-311. Flashes when the BHT tries to communicate with the CU-311 that has not been linked with the BHT. |
| | | Appear cyclically when the BHT receives no response from the CU-311 or when it is waiting for the link to be established with or released from the CU-311. |

**BHT-5000 (BHT-5000 Screen Compatibility Mode)**

This compatibility mode makes the screen layout and key assignment of the BHT-300 series downward compatible with the ones of the BHT-5000. Using this mode can minimize modification in source code to run application programs written for the BHT-5000 on the BHT-300 series.

NOTE    The BHT-5000 screen compatibility mode does not assure full compatibility. The transmission speed, communications link type and others for the IrDA interface, for example, are incompatible. For details, refer to the "BHT-BASIC Programmer's Manual."

Enabling the BHT-5000 screen compatibility mode automatically switches the current communications protocol to the BHT-protocol.

## [4.3] Setting the calendar clock

```
  SET DATE/TIME


00/01/01 00:00

_ /  /     :
```

On the SET SYSTEM menu, selecting "3: DATE/TIME" calls up the screen shown at left.

Use the numerical keys to enter the year (only the last two digits), month, day, hour, and minute in this order, and then press the **ENT** key. If the data is in a single digit, add a 0 (zero) preceding the data.

**NOTE** For the year, be sure to enter the last two digits of the year. For the hour, enter it in the 24-hour format.

If any of the year, month, day, hour, and minute is not entered, the **ENT** key will be deactivated.

If you make a wrong entry, press the **BS** key to delete it and then enter the correct data.

To return to the SET SYSTEM menu, press the **C** key.

⇓

```
  SET DATE/TIME


00/01/01 00:00

04/01/19 16:00_
```

[Example] To set 2004, January 19, at 4:00 p.m.

Press **0**, **4**, **0**, **1**, **1**, **9**, **1**, **6**, **0**, and **0**.
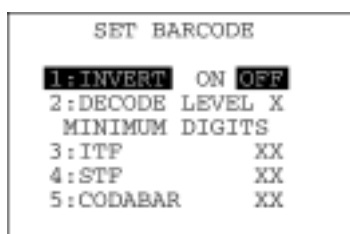
⇓

```
  SET DATE/TIME


04/01/19 16:00

_ /  /     :
```

Press the **ENT** key to register the above setting.

## [4.4]    Setting the special bar-code scanning parameters

```
      SET BARCODE

1:INVERT   ON OFF
2:DECODE LEVEL X
 MINIMUM DIGITS
3:ITF          XX
4:STF          XX
5:CODABAR      XX
```

On the SET SYSTEM menu, selecting "4: BARCODE" calls up the screen shown at left.

Highlighted is the current setting.

| | |
|---|---|
| [1] INVERT: | Activates or deactivates the black-and-white inverted label reading function. |
| [2] DECODE LEVEL: | Sets the decode level. |
| [3] ITF: | Sets the minimum number of digits to be read for ITF. |
| [4] STF: | Sets the minimum number of digits to be read for STF. |
| [5] CODABAR: | Sets the minimum number of digits to be read for Codabar. |

Select a desired item by using the numerical keys or **F5** and **F6** keys, and then select a desired setting by using the **F7** and **F8** keys.

To increase the decode level, press the **F8** key; to decrease it, press the **F7** key.

To increase the number of digits to be read for ITF, STF or Codabar, press the **F8** key; to decrease it, press the **F7** key.

Press the **ENT** key.

To return to the SET SYSTEM menu, press the **C** key.

### INVERT (Black-and-white inverted label reading function)

This function makes it possible to read white bars on a black background.

NOTE    Activating this function might increase the frequency of bar-code reading errors. This function should usually be set to OFF.

### DECODE LEVEL

You can set the decode level. Decreasing the level value increases the bar-code reading efficiency, but the BHT might misread low-quality bar codes (split or stained). To the contrary, increasing the level value decreases the bar-code reading efficiency, but it will diminish the possibility of misreading.

The entry range of the level value is from 1 to 9 and the default is 4.

## MINIMUM DIGITS (Minimum number of digits to be read for ITF, STF, or Codabar)

You can determine the minimum number of digits to be read for ITF, STF, and Codabar. Setting a small number of digits increases the frequency of digit-missing reading or misreading depending upon how to scan bar codes or the quality of bar codes. On the other hand, setting a large number will diminish the possibility of those errors.

The entry range is from 2 to 20 for ITF, from 1 to 20 for STF, and from 3 to 20 for Codabar. The default is 4 for ITF and Codabar, and 3 for STF.
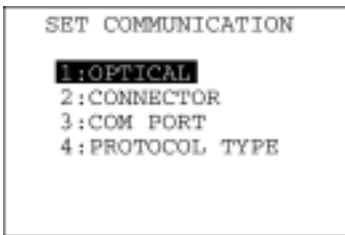
## [4.5]    Setting the communications environments

After the BHT is initialized, the interface port and communications parameters are set as listed in the default table below. Do not access them unless necessary.

| Interface port | Optical (IrDA interface port) | |
|---|---|---|
| Communications protocol | YMODEM | |
| Communications parameters for the IrDA interface port | Defaults | |
|     TRANSMIT SPEED | 115200 bps | |
|     PROTOCOL (Protocol options) | SERIAL No.: | ON (Adds serial numbers to data blocks.) |
| | H. PARITY: | ON (Adds a horizontal parity.) |
| | LINKUP TIME: | 30 seconds |
| | FIELD SPACE: | Ignore (Trim) |

Listed below are the default communications parameters for the direct-connect interface.

| Communications parameters for the direct-connect interface port | Defaults | |
|---|---|---|
|     TRANSMIT SPEED | 115200 bps | |
|     PARITY BIT (Vertical parity) | None | |
|     DATA BIT (Character length) | 8 bits | |
|     STOP BIT (Stop bit length) | 1 bit | |
|     PROTOCOL (Protocol options) | SERIAL No.: | ON (Adds serial numbers to data blocks.) |
| | H. PARITY: | ON (Adds a horizontal parity.) |
| | LINKUP TIME: | 30 seconds |
| | FIELD SPACE: | Ignore (Trim) |

```
SET COMMUNICATION

1:OPTICAL
2:CONNECTOR
3:COM PORT
4:PROTOCOL TYPE
```

On the SET SYSTEM menu, selecting the "5: COMMUNICATION" calls up the screen shown at left.

[1] OPTICAL: Switches to the communications parameters setting screen *for the IrDA interface*.

[2] CONNECTOR: Switches to the communications parameters setting screen *for the direct-connect interface.*

[3] COM PORT: Switches to the interface port setting screen.

[4] PROTOCOL TYPE: Switches to the communications protocol type setting screen.

Select a desired screen by using the numerical keys or **F5** and **F6** keys, and then press the **ENT** key.

To return to the SET SYSTEM menu, press the **C** key.

### Setting the communications parameters for the IrDA interface

```
SET OPTICAL

1:PARAMETER

2:PROTOCOL
```

On the SET COMMUNICATION menu, select "1: OPTICAL" to call up the screen shown at left.

[1] PARAMETER: Switches to the communications parameters setting screen.

[2] PROTOCOL: Switches to the communications protocol option screen.

Select a desired screen by using the numerical keys or **F5** and **F6** keys, and then press the **ENT** key.

To return to the SET COMMUNICATION menu, press the **C** key.

(1)  Communications parameters setting screen

```
    SET PARAMETER
     < OPTICAL >
1:TRANSMIT SPEED:
   2400   9600   19200
  38400  57600  115200
```
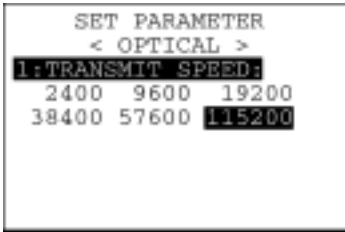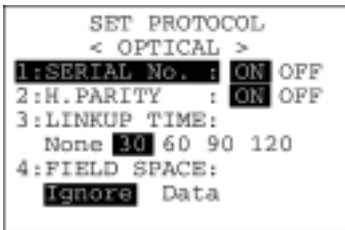
On the SET OPTICAL screen, select "1: PARAMETER" to call up the screen shown at left.

Highlighted is the current setting.

Select the desired transmission speed by using the numerical keys or **F7** and **F8** keys, and then press the **ENT** key.

To return to the SET OPTICAL screen, press the **C** key.

(2)  Communications protocol option screen

```
    SET PROTOCOL
     < OPTICAL >
1:SERIAL No.  : ON  OFF
2:H.PARITY    : ON  OFF
3:LINKUP TIME:
   None  30  60  90  120
4:FIELD SPACE:
   Ignore  Data
```

On the SET OPTICAL screen, select "2: PROTOCOL" to call up the screen shown at left.

Highlighted is the current setting.

[1] SERIAL No.:  Selects whether or not to add serial numbers to data blocks.

[2] H. PARITY:  Selects whether or not to add a horizontal parity.

[3] LINKUP TIME:  Selects the timeout length (in seconds) to be applied when a link is to be established.

[4] FIELD SPACE:  Specifies the treatment of trailing spaces in fields.

To trim trailing spaces in fields, select Ignore; to retain them as data, select Data.

Select a desired item by using the numerical keys or **F5** and **F6** keys. Then select a desired setting by using the **F7** and **F8** keys.

To return to the SET OPTICAL screen, press the **C** key.

NOTE  If the BHT-Ir protocol or YMODEM has been selected, the serial number and horizontal parity settings will be ignored.

**Setting the communications parameters for the direct-connect interface**

SET CONNECTOR

**1:PARAMETER**

2:PROTOCOL

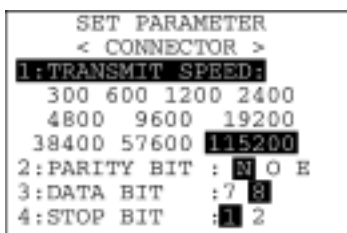On the SET COMMUNICATION menu, select "2: CONNECTOR" to call up the screen shown at left.

[1] PARAMETER: Switches to the communications parameters setting screen.

[2] PROTOCOL: Switches to the communications protocol screen.

Select a desired screen by using the numerical keys or **F5** and **F6** keys, and then press the **ENT** key.

To return to the SET COMMUNICATION menu, press the **C** key.

(1) Communications parameters setting screen

SET PARAMETER
< CONNECTOR >
**1:TRANSMIT SPEED:**
  300 600 1200 2400
  4800  9600  19200
  38400 57600 **115200**
2:PARITY BIT : **N** O E
3:DATA BIT    :7 **8**
4:STOP BIT    :**1** 2

On the SET CONNECTOR screen, select "1: PARAMETER" to call up the screen shown at left.

Highlighted is the current setting.

[1] TRANSMIT SPEED: Sets the transmission speed.

[2] PARITY BIT: Sets the vertical parity: none, odd, or even.

[3] DATA: Sets the character length.

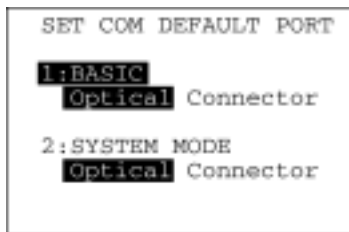[4] STOP: Sets the stop bit length.

Select a desired item by using the numerical keys or **F5** and **F6** keys. Then select a desired setting by using the **F7** and **F8** keys.

To return to the SET CONNECTOR screen, press the **C** key.

NOTE   If the BHT-Ir protocol or YMODEM has been selected, the parity bit, character length, and stop bit length settings will be ignored.

62

(2)  Communications protocol option menu

```
    SET PROTOCOL
   < CONNECTOR >
1:SERIAL No. : ON OFF
2:H.PARITY   : ON OFF
3:LINKUP TIME :
  None 30 60 90 120
4:FIELD SPACE:
  Ignore Data
```

On the SET CONNECTOR screen, select "2: PROTOCOL" to call up the screen shown at left.

Highlighted is the current setting.

[1] SERIAL No.: Selects whether or not to add serial numbers to data blocks.

[2] H. PARITY: Selects whether or not to add a horizontal parity.

[3] LINKUP TIME: Selects the timeout length (in seconds) to be applied when a link is to be established.

[4] FIELD SPACE: Specifies the treatment of trailing spaces in fields.

To trim trailing spaces in fields, select Ignore; to retain them as data, select Data.

Select a desired item by using the numerical keys or **F5** and **F6** keys. Then select a desired setting by using the **F7** and **F8** keys.

To return to the SET CONNECTOR screen, press the **C** key.

NOTE  If the BHT-Ir protocol or YMODEM has been selected, the serial number and horizontal parity settings will be ignored.

### Setting the interface port

```
SET COM DEFAULT PORT

1:BASIC
   Optical  Connector

2:SYSTEM MODE
   Optical  Connector
```

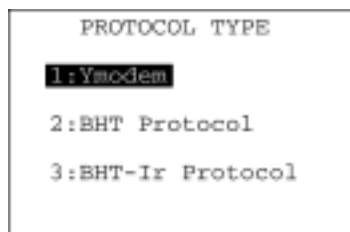On the SET COMMUNICATION menu, select the "3: COM PORT" to call up the screen shown at left.

Highlighted is the current setting.

[1] BASIC:        Selects the IrDA (Optical) or direct-connect (Connector) interface port to be used *for user programs written in BHT-BASIC (OPEN "COM:").*

[2] SYSTEM MODE:  Selects the IrDA (Optical) or direct-connect (Connector) interface port to be used *for downloading or uploading files in System Mode.*

Select a desired item by using the numerical keys or **F5** and **F6** keys. Then select a desired setting by using the **F7** and **F8** keys.

To return to the SET COMMUNICATION menu, press the **C** key.

**Setting the communications protocol type**

On the SET COMMUNICATION menu, select "4: PROTOCOL TYPE" to call up the screen shown at left.

Highlighted is the current setting.

[1] Ymodem: Selects *Ymodem* for file transfer in System Mode or for the execution of XFILE statement in BHT-BASIC.

[2] BHT Protocol: Selects the *BHT-protocol* for file transfer in System Mode or for the execution of XFILE statement in BHT-BASIC.

[3] BHT-Ir Protocol: Selects the *BHT-Ir protocol* for file transfer in System Mode or for the execution of XFILE statement in BHT-BASIC.

To use BHT-BASIC4.0 Transfer Utility, select Ymodem or BHT-Ir protocol.

Select a desired item by using the numerical keys or **F5** and **F6** keys, and then press the **ENT** key.

To return to the SET COMMUNICATION menu, press the **C** key.
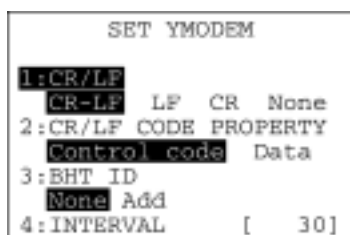
On the PROTOCOL TYPE screen, select "1: Ymodem" to call up the screen shown at left.

[1] CR/LF: Specifies line delimiters.

[2] CR/LF PROPERTY:

Specifies the treatment of line delimiters in records when data files are downloaded.

To treat line delimiters in records as separators, select Control code; to treat them as data, select Data.

[3] BHT ID: Specifies whether or not to add the BHT ID number to packets in YMODEM transfer.

Usually select None. To add the BHT ID number in a transfer tool, select Add. (This setting is not supported. Changing this setting produces nothing.)

[4] INTERVAL: Specifies the retry interval within the range from 1 through 255 in units of 100 ms.

Select a desired item by using the numerical keys or **F5** and **F6** keys. Then select a desired setting by using the **F7** and **F8** keys.

```
        SET ID


    00001 >> _
```

On the PROTOCOL TYPE screen, select the "3: BHT-Ir Protocol" to call up the screen shown at left.

Enter the ID number of the BHT by using the numerical keys, and then press the **ENT** key. If you do not need to modify the current setting, press the **ENT** key only.

NOTE An ID number should be a five-digit decimal character string. The entry range is from 00001 to 65534. If the entry value is less than five digits, the **ENT** key will be deactivated.
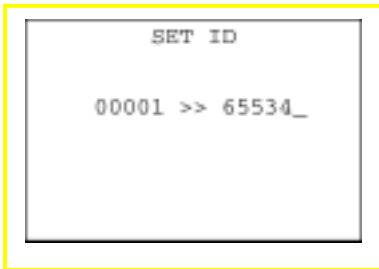
```
        SET ID


    00001 >> 65534_
```

If you make a wrong entry, press the **BS** key to delete it and then enter the correct data.

To return to the SET COMMUNICATION menu, press the **C** key.

## [4.6]    Defining the functions of the shift key and magic keys

```
     SET KEY

  1:SHIFT KEY
  2:M1   KEY
  3:M2   KEY
  4:M3   KEY
  5:M4   KEY
```
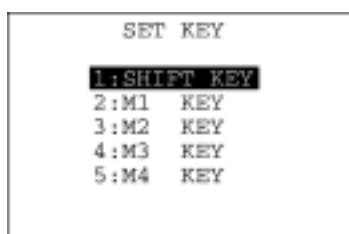
On the SET SYSTEM menu, selecting the "6: KEY" calls up the screen shown at left.

Highlighted is the current setting.

[1] SHIFT KEY:  Switches to the **SF** key definition screen.

[2] M1 KEY:     Switches to the **M1** key definition screen.

[3] M2 KEY:     Switches to the **M2** key definition screen.

[4] M3 KEY:     Switches to the **M3** (left-hand trigger switch) key definition screen.

[5] M4 KEY:     Switches to the **M4** (right-hand trigger switch) key definition screen.

Select a desired screen by using the numerical keys or **F5** and **F6** keys, and then press the **ENT** key.

To return to the SET SYSTEM menu, press the **C** key.

### Defining the function of the shift key

```
  SET SHIFT KEY

   1:Nonlock

   2:Onetime
```

On the SET KEY menu, select "1: SHIFT KEY" to call up the screen shown at left.

Highlighted is the current setting.

[1] Nonlock:    Shifts the keypad only when the **SF** key is held down.

[2] Onetime:    Shifts only one key pressed immediately after the **SF** key is pressed. (The following keys will not be shifted.)

Select a desired setting by using the numerical keys or **F5** and **F6** keys, and then press the **ENT** key. The screen returns to the SET KEY menu.

**Defining the function of M1 , M2 , M3 (left-hand trigger switch), or M4 (right-hand trigger switch) key**

```
     SET M3 KEY

1:None
2:Trigger Switch
3:Shift Key
4:Enter Key
5:Backlight Key
```

On the SET KEY menu, select "2: M1 KEY," "3: M2 KEY," "4: M3 KEY" or "5: M4 KEY" to call up the screen as shown at left. (This example appears when the "4: M3 KEY" is selected.)

Highlighted is the current setting.

The **M1** , **M2** , **M3** or **M4** key can function as listed below.

[1] None:              The key entry will be ignored.

[2] Trigger Switch:  As a trigger switch.

[3] Shift Key:         As a **SF** key.

[4] Enter Key:        As an **ENT** key.

[5] Backlight Key:   As a backlight function on/off key.

Select a desired setting by using the numerical keys or **F5** and **F6** keys, and then press the **ENT** key. The screen returns to the SET KEY menu.

**Magic keys (M1 through M4)**

The **M3** and **M4** keys are assigned the trigger switch function by default. You can make them serve as a **SF** key, **ENT** key, or backlight function on/off key.

If you define the **M1** key as a backlight function on/off key, pressing the **M1** key activates or deactivates the backlight function.

In user programs, a string data can be also assigned to these magic keys.

NOTE    The backlight function on/off key can be assigned only to any one of **M1** through **M4** keys. The key defined more recently will act as a backlight function on/off key and one defined earlier will be ignored.

That is, if you define the **M1** and **M2** keys as a backlight function on/off key in this order, the **M2** key will work as a backlight function on/off key and the **M1** key's entry will be ignored.

## [4.7]    Setting the resume function

```
    SET RESUME

  1:ON    2:OFF
```

On the SET SYSTEM menu, selecting "7: RESUME" calls up the screen shown at left.

Highlighted is the current setting.

[1] ON:    Activates the resume function that resumes the current BHT status (screen) where the BHT was turned off, when the BHT is turned on.

[2] OFF:   Deactivates the resume function.

Select a desired item by using the numerical keys or **F5** and **F6** keys, and then press the **ENT** key.

To return to the SET SYSTEM menu, press the **C** key.

## [4.8]    Defragmenting the drive

```
  USER AREA DEFRAG
```
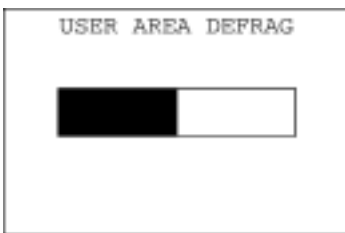
On the SET SYSTEM menu, selecting "8: DEFRAG" starts defragmenting the whole user area of the drive.

Defragmentation will reorganize the user area so that it may increase the empty space.

If defragmented, the BHT may download files more efficiently than before execution of defragmentation.

During defragmentation, a bar graph will appear indicating the defragmentation progress.

Upon completion of defragmentation, the screen will automatically return to the SET SYSTEM menu.

## [4.9]　Setting the TCP/IP, FTP and DHCP (in LAN-support software only)

SET TCP/IP

1:SET TCP/IP

2:SET FTP

3:SET DHCP

On the SET SYSTEM menu, selecting "9: TCP/IP" calls up the screen shown at left.

[1] SET TCP/IP:　Switches to the TCP/IP setting screen.

[2] SET FTP:　　Switches to the FTP setting screen.

[3] SET DHCP:　Switches to the DHCP setting screen.

Select a desired item by using the numerical keys or **F5** and **F6** keys, and then press the **ENT** key.

To return to the SET SYSTEM menu, press the **C** key.

## [4.9-1]　Setting the TCP/IP

SET TCP/IP

1:DEVICE

2:IP ADDRESS

3:TIMEOUT

On the SET TCP/IP, FTP and DHCP menu, selecting "1: SET TCP/IP" calls up the screen shown at left.

[1] DEVICE:　　Switches to the TCP/IP DEVICE screen.

[2] IP ADDRESS　Switches to the IP ADDRESS screen.

[3] TIMEOUT:　Switches to the TIMEOUT screen.

Select a desired item by using the numerical keys or **F5** and **F6** keys, and then press the **ENT** key.

To return to the SET TCP/IP, FTP and DHCP menu, press the **C** key.

### (1) TCP/IP device screen

SET TCP/IP DEVICE

1:TCP/IP DEVICE
COM1
2:LINK LAYER
Ethernet
3:TRANSMIT SPEED
115200

On the SET TCP/IP screen, select "1: DEVICE" to call up the screen shown at left where the current communications device, link layer, and transmission speed are displayed.

To return to the SET TCP/IP screen, press the **C** key.

**(2)  IP address screen**

```
    SET ADDRESS

1:IP ADDRESS
   [XXX.XXX.XXX.XXX]
2:SUBNET MASK
   [YYY.YYY.YYY.YYY]
3:DEFAULT GATEWAY
   [ZZZ.ZZZ.ZZZ.ZZZ]
```

On the SET TCP/IP screen, select "2: IP ADDRESS" to call up the screen shown at left where the current settings are displayed.

Select a desired item by using the numerical keys or **F5** and **F6** keys, and then press the **ENT** key. The entry box of the selected item becomes ready to accept entry and shows a cursor.

Enter the desired value by using the numerical keys and period (.) key, and then press the **ENT** key.

In the entry mode, to delete a single character, press the **BS** key. To delete the whole entry you made, press the **C** key.

To return to the SET TCP/IP screen, press the **C** key when any item is highlighted.

If all of the IP address, subnet mask and default gateway are set to [0.0.0.0], the DHCP is enabled.

**(3)  Timeout screen**

```
   SET TIMEOUT  1/2
  < CONNECTION >

1:RETRY COUNT
              [nnnnn]
2:RETRY INTERVAL
              [nnnnn]
```

**F5** key ⇑  ⇓ **F6** key

```
   SET TIMEOUT  2/2
  < DISCONNECTION >

3:RETRY COUNT
              [nnnnn]
4:RETRY INTERVAL
              (nnnnn)
5:TIMEOUT    [nnnnn]
```

On the SET TCP/IP screen, select "3: TIMEOUT" to call up the screen shown at left where the current settings are displayed.

Select a desired item by using the numerical keys or **F5** and **F6** keys, and then press the **ENT** key. The entry box of the selected item becomes ready to accept entry and shows a cursor.

Enter the desired value by using the numerical keys, and then press the **ENT** key.

In the entry mode, to delete a single character, press the **BS** key. To delete the whole entry you made, press the **C** key.

To return to the SET TCP/IP menu, press the **C** key when any item is highlighted.

## [4.9-2]  Setting the FTP

SET FTP

**1:SERVER**

2:OPTION

On the SET TCP/IP, FTP and DHCP menu, select "2: SET FTP" calls up the screen shown at left.
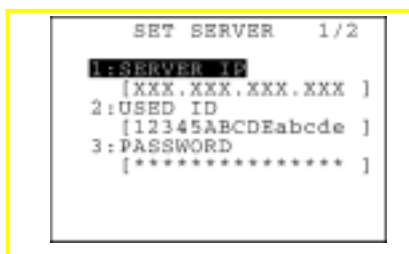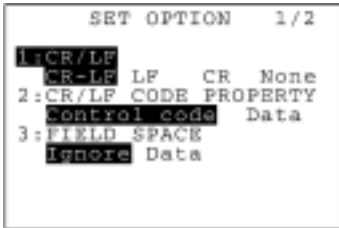
[1] SERVER:  Switches to the FTP server connection environments screen.

[2] OPTION:  Switches to the data transfer parameters screen.

Select a desired item by using the numerical keys or **F5** and **F6** keys, and then press the **ENT** key.

To return to the SET TCP/IP, FTP and DHCP menu, press the **C** key.

### (1)  FTP server connection environments screen

SET SERVER   1/2

**1:SERVER IP**
　[XXX.XXX.XXX.XXX ]
2:USED ID
　[12345ABCDEabcde ]
3:PASSWORD
　[*************** ]

**F5** key ⇧　⇩ **F6** key

SET SERVER   2/2

**4:DEFAULT DIR**

　[　　　　　　　　　]

On the SET FTP menu, select "1: SERVER" to call up the screen shown at left where the current settings are displayed.

[1] SERVER IP:  Sets the IP address of an FTP server.

[2] USER ID:  Sets a user name.

[3] PASSWORD:  Sets a password.

[4] DEFAULT DIR:  Specifies an initial directory through which the FTP server will search for files for transfer first when the FTP client gets connected to the server.

Select a desired item by using the numerical keys or **F5** and **F6** keys, and then press the **ENT** key. The entry box of the selected item becomes ready to accept entry and shows a cursor.

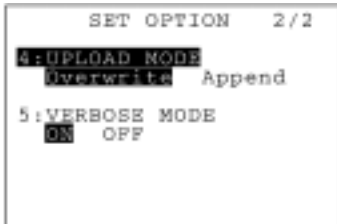Enter the desired value by using the numerical keys and period (.) key and then press the **ENT** key.

Pressing the **SF** key switches the entry mode between the numeric mode (without a guidance) and alphabet mode.

In the entry mode, to delete a single character, press the **BS** key. To delete the whole entry you made, press the **C** key.

To return to the SET FTP menu, press the **C** key when any item is highlighted.

**(2)  FTP options screen**
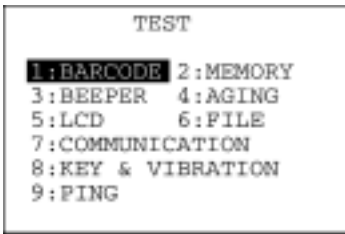
```
    SET OPTION   1/2

1:CR/LF
   CR-LF  LF   CR   None
2:CR/LF CODE PROPERTY
   Control code    Data
3:FIELD SPACE
   Ignore Data
```

**F5** key ⇑   ⇓ **F6** key

```
    SET OPTION   2/2

4:UPLOAD MODE
   Overwrite   Append

5:VERBOSE MODE
   ON   OFF
```

On the SET FTP menu, select "2: OPTION" to call up the screen shown at left where the current settings are displayed.

[1] CR/LF: Specifies line delimiters that should match ones used in the server OS.

[2] CR/LF CODE PROPERTY:

Specifies the treatment of line delimiters in records when data files are downloaded.

To treat line delimiters in records as separators, select Control code; to treat them as data, select Data.

[3] FIELD SPACE: Specifies the treatment of trailing spaces in fields.

To trim trailing spaces in fields, select Ignore; to retain them as data, select Data.

[4] UPLOAD MODE: Selects whether uploaded files will be written over the existing files or appended to them.

[5] VERBOSE MODE: Selects whether or not to display reply codes & messages (given on page 96) sent by the FTP server on the FTP client.

If the VERBOSE MODE is set to OFF, no such reply codes will display but only the messages (given on page 95) issued by the BHT will appear.

If it is set to ON, both will display.

Select a desired item by using the numerical keys or **F5** and **F6** keys. Then select a desired setting by using the **F7** and **F8** keys.

To return to the SET FTP menu, press the **C** key.

73

## [4.9-3] Setting the DHCP

```
      SET DHCP

  1:TIMEOUT [XXXXX]
```

On the SET TCP/IP, FTP and DHCP menu, selecting "3: DHCP" calls up the screen shown at left. The current setting is displayed.

[1] TIMEOUT:  Sets the timeout for getting the IP configuration from the DHCP server. The entry range is from 00001 to 32767 seconds.

> **NOTE** You can enter up to 32767 seconds, but in actual operation, a maximum of 190 seconds are available since the number of retries and retry intervals are determined in your system.

Press the **ENT** key. The entry box of the selected item becomes ready to accept entry and shows a cursor.

**C** key ⇑  ⇓ Period (.) key with **SF** held down

Enter the desired value by using the numerical keys and then press the **ENT** key.

In the entry mode, to delete a single character, press the **BS** key. To delete the whole entry you made, press the **C** key.

To return to the SET TCP/IP, FTP and DHCP menu, press the **C** key when any item is highlighted.

```
   NETWORK[DHCP]

IP ADDRESS
  XXX.XXX.XXX.XXX
SUBNET MASK
  YYY.YYY.YYY.YYY
DEFAULT GATEWAY
  ZZZ.ZZZ.ZZZ.ZZZ
```

If you press the period (.) key while holding down the **SF** key, the obtained IP configuration appears as shown at left. To return to the SET DHCP screen shown above, press the **C** key.

> **NOTE** If you display the obtained IP configuration when any of the IP address, subnet mask and default gateway is set to any value other than "0.0.0.0," the (DHCP) does not appear on the screen shown at left.

74

# [ 5 ]  Testing

```
           TEST

1:BARCODE  2:MEMORY
3:BEEPER   4:AGING
5:LCD      6:FILE
7:COMMUNICATION
8:KEY & VIBRATION
9:PING
```

On the SYSTEM MENU, selecting "5: TEST" calls up the screen shown at left.

[1] BARCODE:              Selects the bar-code reading test.

[2] MEMORY:               Selects the RAM read/write test.

[3] BEEPER:               Selects the beeper scale test.

[4] AGING:                Selects the aging test.

[5] LCD:                  Selects the LCD and indicator LED tests.

[6] FILE:                 Selects the file checksum test.

[7] COMMUNICATION:        Selects the communications test.

[8] KEY & VIBRATION:      Selects the key entry, beeper and vibrator tests.

[9] PING:                 Selects PING (in LAN-support software only).

Select a desired setting by using the numerical keys or **F5** and **F6** keys, and then press the **ENT** key. The selected test will start.

Highlighted is the currently selected item.

To return to the SYSTEM MENU, press the **C** key.

---

NOTE   If an error occurs in any of the above tests, contact your nearest dealer.

## [5.1]　Bar-code reading test

```
  TEST  BARCODE
```

On the TEST menu, selecting "1: BARCODE" calls up the screen shown at left.

Actually read bar codes with the BHT and check the read data displayed on the LCD.

⇓

Bar-code type

　Number of digits of the bar code

```
  TEST  BARCODE
A 13
4999999999999
```
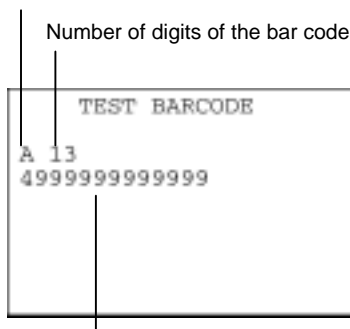
Upon completion of bar-code reading, the BHT beeps, turns on the indicator LED in green, and displays the read data together with the barcode type and the number of digits.

To return to the TEST menu, press the **C** key.

Data

Listed below is a table showing the relationship between the bar-code types and the identifier letters to be displayed on the LCD.

| Bar-code Type | ID Letters |
|---|:---:|
| EAN-13, UPC-A | A |
| EAN-8 | B |
| UPC-E | C |
| Standard 2of5 (STF) | H |
| Interleaved 2of5 (ITF)* | I |
| Codabar (NW-7) | N |
| Code 39 | M |
| Code 93 | L |
| Code 128 | K |
| EAN-128 | W |

* The BHT can read only those ITF bar codes having 4 digits or more in length.

## [5.2]    Memory test

```
    TEST MEMORY

   ** Testing **
    XXXXX/YYYYY
```

On the TEST menu, selecting "2: MEMORY" calls up the screen shown at left and starts writing and reading onto/from all areas of the RAM as well as checking the address.

XXXXX: Tested RAM capacity (unit: kilobytes)
YYYYY: Total RAM capacity (unit: kilobytes)

```
    TEST MEMORY

   ** Test NG **
    XXXXX/YYYYY

Address : ZZZZZZZZ
  Write : AAAAAAAA
   Read : BBBBBBBB
```

If any error is detected, the BHT beeps three times, shows the message as shown at left, and terminates the test.

Where,

ZZZZZZZZ: Address where an error has occurred.
AAAAAAAA: Data to write.
BBBBBBBB: Data read out from the RAM.

To return to the TEST menu, press the **C** key.

```
    TEST MEMORY

   ** Test OK **
    YYYYY/YYYYY
```

Upon normal completion of the RAM test, the BHT beeps once, shows the message as shown at left, and returns to the TEST menu.

## [5.3]    Beeper scale test

```
TEST BEEPER
```

On the TEST menu, selecting "3: BEEPER" calls up the screen shown at left and makes the beeper sound at three octaves listed below.

Upon completion of this test, the BHT automatically returns to the TEST menu.

To stop this test while in progress, turn the BHT off.

| Scale | Frequency (Hz) | | | |
|-------|------|------|------|------|
| do  | 523 | 1046 | 2093 | 4186 |
| re  | 587 | 1174 | 2349 | -    |
| mi  | 659 | 1318 | 2637 | -    |
| fa  | 698 | 1396 | 2793 | -    |
| sol | 783 | 1567 | 3135 | -    |
| la  | 880 | 1760 | 3520 | -    |
| ti  | 987 | 1975 | 3951 | -    |

## [5.4]    Aging test

```
TEST AGING

DATE   04/02/19
TIME   15:30:00
```
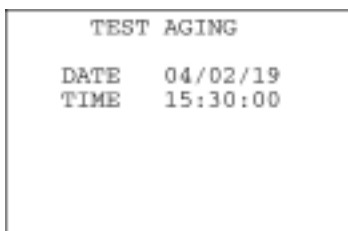
On the TEST menu, selecting "4: AGING" proceeds to the aging test while showing the current date and time on the LCD. (This test is intended for personnel which check the BHT in the factory.)

NOTE  Once this test is selected, the automatic powering-off function becomes disabled. To terminate this test, press the **C** key to return to the TEST menu or turn the BHT off.

## [5.5]    LCD and indicator LED tests
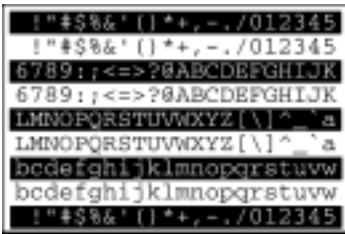


On the TEST menu, selecting "5: LCD" calls up the test pattern shown at left on the LCD. The indicator LED is off.

Each time the **ENT** key is pressed, the screen shifts to the next test pattern. To return to the previous screen, press the **BS** key.

To stop this test while in progress, press the **C** key.

**BS** key ⇑   ⇓ **ENT** key
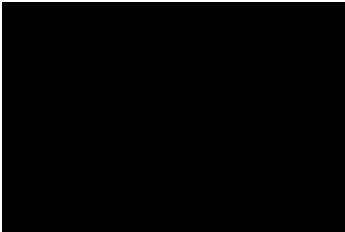


As shown at left, the entire screen turns black. The indicator LED lights in green.

**BS** key ⇑   ⇓ **ENT** key



As shown at left, everything disappears and the indicator LED lights in red.

**BS** key ⇑   ⇓ **ENT** key



An outline with a width of one dot appears.

Press the **ENT** key, and the BHT beeps once and returns to the TEST menu.

79

## [5.6]    File test

```
     TEST FILE

 SAMPLE01.PD4
 SAMPLE02.PD4
*SAMPLE03.PD4
+SAMPLE04.PD4

       SIZE:XXXXX
       FREE:YYYYY
```

On the TEST menu, selecting "6: FILE" calls up the screen shown at left.

XXXXXX:    Memory space being used
YYYYYY:    Free memory space

If any of the files stored in the memory is defective, an asterisk (*) or plus sign (+) is prefixed to the name of the defective file (s). For details about the (*) and (+), refer to Section 2.3.6, "[ 3 ] About "$$BRKLST.SYS."

Selecting a particular file on this screen will show the file size and the test result.

To select a file, use the **F5** and **F6** keys to move the cursor to the desired file. If there are more than four files, the screen will scroll.

Highlighted is the currently selected file.

Press the **C** key to return to the TEST menu.

```
     TEST FILE

 SAMPLE01.PD4
 00004096 bytes
       OK

       SIZE:XXXXX
       FREE:YYYYY
```

The file name, file size, and test result (OK or NG) appear as shown at left.

```
     TEST FILE

 SAMPLE01.PD4
 00004096 bytes
       NG

       SIZE:XXXXX
       FREE:YYYYY
```

Press the **C** key to return to the file selection screen.

---

NOTE    If a defective file is found, delete it or overwrite it with the same name file.

Even a defective file can be uploaded on the UPLOAD menu. It is, therefore, recommended that important files be uploaded before deleted.

## [5.7]    Communications test

In System Mode, you can test the IrDA interface port and direct-connect interface port.

### ■ Preparation for the IrDA interface test

Arrange two BHTs, one as a master station and the other as a slave station (to be tested) with their IrDA interface ports facing each other as illustrated below. In this test, the slave BHT transmits data to the master BHT and receives the data sent back from the master BHT.
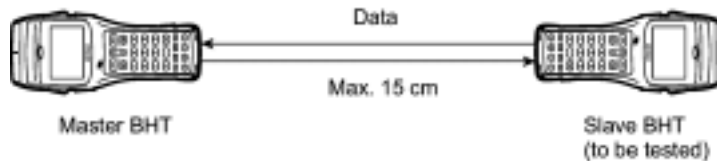


### ■ Preparation for the direct-connect interface test

Arrange a 3-pole mini stereo plug as illustrated below and connect it to the direct-connect interface port on the BHT.
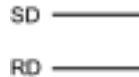




On the TEST menu, selecting the "7: COMMUNICATION" calls up the screen shown at left.

[1] OPTICAL:        Switches to the MASTER/SLAVE selection screen for the IrDA interface test.

[2] CONNECTOR:   Tests the direct-connect interface port.

Select a desired item by using the numerical keys or **F5** and **F6** keys, then press the **ENT** key.

81

### Testing the IrDA interface port

```
TEST COMMUNICATION
    < OPTICAL >

      1:SLAVE

      2:MASTER
```

On the TEST COMMUNICATION menu, selecting "1: OPTICAL" calls up the screen shown at left.

At the slave BHT to be tested, select the "1: SLAVE" and at the master BHT, select the "2: MASTER." Then press the **ENT** key.

```
TEST COMMUNICATION
    < OPTICAL >

   ** Testing  **
```

During the test, the screen shown at left is displayed.

```
TEST COMMUNICATION
    < OPTICAL >

   ** Test NG **
       (XX)
```

If any error occurs, the tested slave BHT beeps three times and shows the screen at left.

In parentheses are error codes which have the following meanings:

(X X)

    1: The received data is different from the sent data.
    2: A timeout has occurred during standby for data reception.

  1:   2400 bps
  2:   9600 bps
  3: 115200 bps

The master BHT automatically returns to the TEST COMMUNICATION menu after 10 seconds from the occurrence of an error.

Press the **C** key to return to the TEST COMMUNICATION menu.

```
TEST COMMUNICATION
    < OPTICAL >

   ** Test OK **
```

Upon normal completion of the test, the tested slave BHT beeps once and shows the screen at left.

Press the **C** key to return to the TEST COMMUNICATION menu.

The master BHT automatically returns to the TEST COMMUNICATION menu.

**Testing the direct-connect interface port**

```
TEST COMMUNICATION
  < CONNECTOR >

  ** Testing **
```

On the TEST COMMUNICATION menu, selecting "2: CONNECTOR" displays the screen shown at left and then starts testing the direct-connect interface port.

```
TEST COMMUNICATION
  < CONNECTOR >

  ** Test NG **
      (XX)
```

If any error occurs, the BHT beeps three times and shows the screen at left.

In parentheses are error codes which have the following meanings:

(X X)

1: The received data is different from the sent data.

2: A timeout has occurred during standby for data reception.

1:    300 bps
2: 115200 bps

```
TEST COMMUNICATION
  < CONNECTOR >

  ** Test OK **
```

Upon normal completion of the test, the BHT beeps once and shows the screen at left.

Press the **C** key to return to the TEST COMMUNICATION menu.

## [5.8]    Key-entry, beeper and vibrator test

```
TEST KEY & BEEPER
   & VIBRATION
```

On the TEST menu, selecting "8: KEY & VIBRATION" calls up the screen shown at left and makes the BHT ready for entry from the keypad.

Pressing individual keys displays the identifier letters in the positions pre-assigned to those keys on the LCD as well as sounding the beeper or running the vibrator. (As long as the individual key is held down, the BHT continues beeping or vibrating.)

Pressing the same key again erases the displayed letter.

The table below shows the relationship between the keys, the identifier letters to be displayed on the LCD, and the frequencies (Hz) of the beeper.

| Key | Letter | Beeper (Hz) | Key | Letter | Beeper (Hz) | Key | Letter | Beeper (Hz) |
|-----|--------|-------------|-----|--------|-------------|-----|--------|-------------|
| M3 | N | (Note) | 6 | 6 | 659 | F3 | C | 1567 |
| M1 | L | 293 | 1 | 1 | 698 | F4 | D | 1760 |
| M2 | M | 329 | 2 | 2 | 783 | F5 | E | 1975 |
| M4 | O | (Note) | 3 | 3 | 880 | F6 | F | 2093 |
| 7 | 7 | 391 | 0 | 0 | 987 | F7 | G | 2349 |
| 8 | 8 | 440 | . | . | 1046 | F8 | H | 2637 |
| 9 | 9 | 493 | ENT | = | 1174 | BS | I | 2793 |
| 4 | 4 | 523 | F1 | A | 1318 | C | J | 3135 |
| 5 | 5 | 587 | F2 | B | 1396 | SF | K | 3520 |

(Note) Only when the **M3** (left-hand trigger switch) or **M4** key (right-hand trigger switch) is pressed, the vibrator works.

```
TEST KEY & BEEPER
   & VIBRATION

NLMO
7894561230.=
ABCDEFGH
IJK
```

After all keys are pressed and displayed on the LCD, this test automatically ends and the screen returns to the TEST menu.

To stop this test, turn the BHT off.

# [5.9] Testing with PING (in LAN-support software only)

```
    TEST PING

  1:RUN PING

  2:SET PING

  3:SET DEVICE
```

On the TEST menu, selecting "9: PING" calls up the screen shown at left.

[1] RUN PING: Runs PING.

[2] SET PING: Switches to the PING parameter setting screen.

[3] SET DEVICE: Switches to the PING device setting screen.

Select a desired item by using the numerical keys or **F5** and **F6** keys, and then press the **ENT** key.

To return to the TEST menu, press the **C** key.

## (1) PING screen

```
      RUN PING

DESTINATION IP
      XXX.XXX.XXX.XXX
DATA SIZE      XXXXX
INTERVAL       XXXXX
TIMEOUT        XXXXX
SEND TYPE      TYPEn

COUNT         [XXXXX█
```

On the TEST PING menu, select "1: RUN PING" to call up the screen shown at left where the current settings are displayed.

The COUNT entry box enclosed with brackets is ready to accept data. If you want to modify the number of echo requests displayed, enter the desired value by using the numerical keys.

To delete a single character, press the **BS** key. To delete the whole entry you made, press the **C** key.

⇓

Press the **ENT** key to start PING.

(PING running screen)

```
      RUN PING

**** PING Start *****

  OK      : XXXXX
            [XXXXX]
  NG      : XXXXX
  TIMEOUT : XXXXX
  IP xxx.xxx.xxx.xxx
```

Once PING starts running, the message shown at left will appear.

To stop PING, press the **C** key.

The PING result may include the following:

OK: Displays the number of echo replies.
[XXXXX]: Echo reply time in milliseconds

NG: Displays the number of errors found during execution of PING.

(PING end screen)

```
      RUN PING

**** PING Start *****

  OK      : XXXXX
            [XXXXX]
  NG      : XXXXX
  TIMEOUT : XXXXX
***** PING End ******
```

TIMEOUT: Displays the number of timeouts (for echo replies) that took place during execution of PING.

IP: Displays the BHT's IP address during execution of PING only.

**PING run-time messages (that will appear in the middle of the LCD)**

| Message | Displays when: |
| --- | --- |
| Waiting | Setting up PING. |
| Opening TCP/IP | Opening devices. |
| Routing TCP/IP | Connecting to the TCP/IP communications pathway. |
| PING start | Starting PING. |
| Device error | Failed to open a device. |
| TCP/IP error | Failed to connect to the TCP/IP communications pathway. |

**PING termination messages (that will appear in the bottom of the LCD)**

| Message | Displays when: |
| --- | --- |
| PING end | PING has ended normally. |
| PING aborted | PING has aborted. |
| PING error | An error has occurred during running of PING. |

**(2) Setting PING parameters**



On the TEST PING menu, select "2: SET PING" to call up the screen shown at left where the current settings are displayed.

[1] DESTINATION IP: Specifies the IP address of a host PC that you want to ping.

[2] DATA SIZE: Specifies the data size of an echo request.

[3] INTERVAL: Specifies the echo request intervals (in units of 100 ms).

[4] TIMEOUT: Specifies the timeout period (in units of 100 ms) for an echo request.

[5] COUNT: Specifies the number of echo requests to be sent.

[6] SEND TYPE: Selects the echo request send timing TYPE 1 or TYPE 2. (See page 88.)

The entry range for each of "2:DATA SIZE" through "5:COUNT" items is listed on the next page.

Select a desired item by using the numerical keys or **F5** and **F6** keys.

If you select one of "1: DESTINATION IP" through "5: COUNT" items and press the **ENT** key, then the entry box of that item becomes ready to accept entry and a cursor appears. Enter the desired value by using the numerical keys and period (.) key, and then press the **ENT** key.

In the entry mode, to delete a single character, press the **BS** key. To delete the whole entry you made, press the **C** key.

If "6: SEND TYPE" is selected, use the **F7** and **F8** keys to choose the desired type.

To return to the TEST PING menu, press the **C** key when any item is highlighted.

Entry Range for DATA SIZE, INTERVAL, TIMEOUT, and COUNT

| Item | Allowable entry range | Initial value |
| --- | --- | --- |
| DATA SIZE | 4 to 1472 | 56 |
| INTERVAL | 0 to 65535 | 10 |
| TIMEOUT | 0 to 65535 | 10 |
| COUNT | 0* to 65535 | 4 |

* Specification of zero (0) will set the number of echo requests to "infinite," keeping sending echo requests (until PING is aborted).

If you specify a value out of the allowable entry range listed above, the nearest value within the range will automatically apply.

PING Echo Request Send Timing (SEND TYPE)

Two types of echo request send timings are available: TYPE 1 and TYPE 2.

■ TYPE 1

After sending an echo request, PING waits for the period specified by INTERVAL and then sends an echo request again. For TYPE 1, the relationship between the INTERVAL and TIMEOUT should be "INTERVAL $\geq$ TIMEOUT."

Sends an echo request

Receives an echo reply

Timeout period

Interval

Sends an echo request
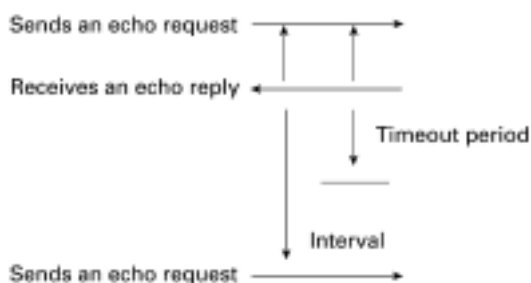
■ TYPE 2

After sending an echo request, PING waits for an echo reply to be received or for timeout to occur. After that, PING waits for the period specified by INTERVAL and then sends an echo request again. For TYPE 2, no relationship between the INTERVAL and TIMEOUT is required.

If PING receives an echo reply:

Sends an echo request

Receives an echo reply

Interval

Sends an echo request

If a timeout occurs:

Sends an echo request

Timeout period

Timeout occurs

Interval

Sends an echo request
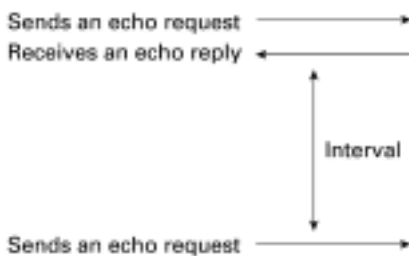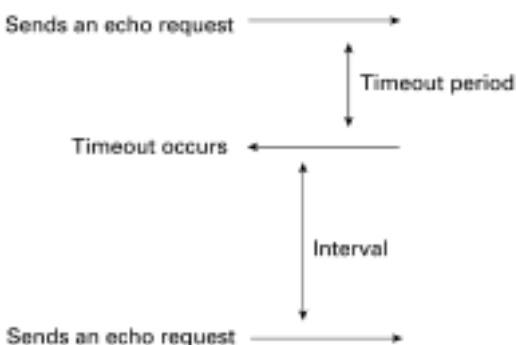
**(3)  PING device screen**

```
SET PING DEVICE

1:TCP/IP DEVICE
  COM1
2:LINK LAYER
  Ethernet
3:TRANSMIT SPEED
  115200
```

On the TEST PING menu, select "3: SET DEVICE" to call up the screen shown at left where the current TCP/IP device, link layer, and transmission speed are displayed.

To return to the TEST PING menu, press the **C** key when any item is highlighted.

# [ 6 ]   System Information

## [6.1]   Displaying the BHT system information

```
SYSTEM INFORMATION

SYSTEM Ver. : X.XX
ROM SIZE    :    XMB
RAM SIZE    :    XMB
SYSTEM MESSAGE:
    Japanese  X.XX
FONT    ENT
```

On the SYSTEM MENU, selecting the "6: VERSION" calls up the screen shown at left, displaying the system program version, ROM and RAM sizes, system message version, and font types and their versions.

Press the **C** key to return to the SYSTEM MENU.

**BS** key ⇑　⇓ **ENT** key

```
SYSTEM INFORMATION

FONT        :
    JIS1(16)   X.XX
    JIS2(16)   X.XX
    JIS1(12)   X.XX
    JIS2(12)   X.XX
```

The following font types are displayed:

　　JIS1 (16):　JIS Level 1 font, 16-dot
　　JIS2 (16):　JIS Level 2 font, 16-dot
　　JIS1 (12):　JIS Level 1 font, 12-dot
　　JIS2 (12):　JIS Level 2 font, 12-dot

## [6.2]   Displaying the CU-311 system information (in LAN-support software only)

```
SYSTEM INFORMATION

SYSTEM Ver. : X.XX
ROM SIZE    :    XMB
RAM SIZE    :    XMB
SYSTEM MESSAGE:
    Japanese  X.XX
FONT    ENT
```

If placed on the CU-311, the BHT can display the CU-311 system information.

On the SYSTEM INFORMATION screen (that can be called up by selecting "6: VERSION" on the SYSTEM MENU), press the **M2** key.

The CU INFORMATION screen will appear where the CU-311 system version and MAC address are displayed.

**M1** key ⇑　⇓ **M2** key

```
   CU INFORMATION

SYSTEM Ver. :   X.XX

MAC ADDRESS :
       XXXXXXXXXXXX
```

To return to the SYSTEM INFORMATION screen, press the **M1** key.

## If the M2 key is pressed when the BHT is not placed on the CU-311

```
     CU INFORMATION


   Info load failure.


-----------------------
[ENT]Reload [C]Return
```

The error message shown at left will appear.

Press the **C** key to return to the SYSTEM INFORMATION screen.

# [ 7 ]   Downloading/Uploading by FTP (in LAN-support software only)

```
FTP MENU

1:DOWNLOAD

2:UPLOAD
```

On the SYSTEM MENU, selecting "7: FTP" calls up the screen shown at left.

[1] DOWNLOAD:   Downloads a file by FTP.

[2] UPLOAD:   Uploads a file(s) by FTP.

Select a desired item by using the numerical keys or **F5** and **F6** keys, and then press the **ENT** key.

To return to the SYSTEM MENU, press the **C** key.

## [7.1]   Downloading by FTP

```
DOWNLOAD FILE
1:DIR/FILE
  [                    ]
2:FIELDS
  [                    ]
------------------------
```

On the FTP MENU, selecting "1: DOWNLOAD" calls up the screen shown at left where the current settings are displayed.

— Entry box for a directory and/or file name
— Entry box for field information of a data file to be downloaded

— Status message

— IP address of an FTP server you have specified

— Current directory reserved

**M1** key ⇑   ⇓ **M2** key

```
DOWNLOAD FILE
SERVER IP:
    XXX.XXX.XXX.XXX
CURRENT DIRECTORY:
...ABCD/EFG/0000
------------------------
```

[1] DIR/FILE:   Specifies a directory and/or file name. (For details, refer to the next page.)

[2] FIELDS:   Specifies field information of a data file. (For details, refer to the next page.)

Select a desired item by using the numerical keys or **F5** and **F6** keys, and then press the **ENT** key. The entry box of the selected item becomes ready to accept entry and a cursor appears.

Enter the desired value by using the numerical keys and period (.) key and then press the **ENT** key.

Pressing the **SF** key switches the entry mode between the numeric mode (without a guidance) and alphabet mode.

In the entry mode, to delete a single character, press the **BS** key. To delete the whole entry you made, press the **C** key.
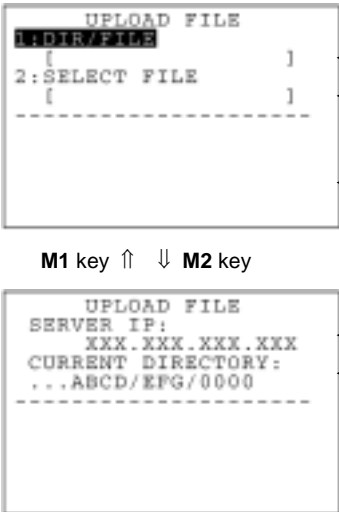
To return to the FTP MENU, press the **C** key when any item is highlighted.

DIR/FILE entry box: The FTP client will interpret a character string entered into this box as a directory name at first, so it will send a Change Directory request to the FTP server. If the specified directory exists in the FTP server, the server will change a directory from the default to that specified one; if not, the FTP client will interpret the entered character string as a file name and send a Download request to the server.

FIELDS entry box: Only when downloading a data file, you need to enter field information into this box. Before starting downloading, enter field information by using numerical keys and period (.) key. Pressing the period (.) key will enter a comma (,). For downloading of program files, nothing is required to enter.

## [7.2]    Uploading by FTP

On the FTP MENU, selecting "2: UPLOAD" calls up the screen shown at left if a file(s) exists. The current settings are displayed.

— Entry box for a directory and/or file name

— File name currently selected (Nothing is displayed at the initial state of the FTP client.)

— Status message

**M1** key ⇑   ⇓ **M2** key

— IP address of an FTP server you have specified

— Current directory reserved

[1] DIR/FILE:      Specifies a directory and/or file name. (For details, refer to the next page.)

[2] SELECT FILE:   Selects a file to be uploaded. (For details, refer to the next page.)

Select a desired item by using the numerical keys or **F5** and **F6** keys, and then press the **ENT** key.

If you select "1: DIR/FILE," its entry box becomes ready to accept entry and shows a cursor.

Enter the desired value by using the numerical keys and period (.) key, and then press the **ENT** key.

Pressing the **SF** key switches the entry mode between the numeric mode (without a guidance) and alphabet mode.

In the entry mode, to delete a single character, press the **BS** key. To delete the whole entry you made, press the **C** key.

To return to the FTP MENU, press the **C** key when any item is highlighted.

```
        UPLOAD FILE

    SAMPLE01.DAT
    SAMPLE02.DAT
    SAMPLE03.DAT
    SAMPLE04.DAT
    SAMPLE05.DAT
```

If you select "2: SELECT FILE," the screen shown at left will appear.

Choose a file to be uploaded by using the **F5** and **F6** keys, then press the **ENT** key. The screen returns to the previous one where the selected file appears in the SELECT FILE entry box.

DIR/FILE entry box: The FTP client will interpret a character string entered into this box as a directory name at first, so it will send a Change Directory request to the FTP server. If the specified directory exists in the FTP server, the server will change a directory from the default to that specified one; if not, the FTP client will interpret the entered character string as a file name and send an Upload request to the server.

If a file name specified here is different from the one that is specified in the SELECT FILE entry box, then the FTP client will use the file name specified in this entry box for uploading.

If you enter nothing in this entry box and press the **ENT** key, the FTP client will use the file name specified in the SELECT FILE entry box for uploading.

SELECT FILE entry box: For uploading, you need to choose a file to be uploaded and display its name in this entry box beforehand. Without a file name in this entry box, uploading will result in an error.

If the attributes (e.g., PD4, FN4, EX4, PD3, FN3, EX3, and extensions of data files) of the selected file are different from those specified in the DIR/FILE entry box, then an error will result.

**If no file exists when uploading by FTP is selected**

```
        UPLOAD FILE

    * * * * * * * * * * * * * * * * *
    *  NO FILE EXISTS  *
    * * * * * * * * * * * * * * * * *
```
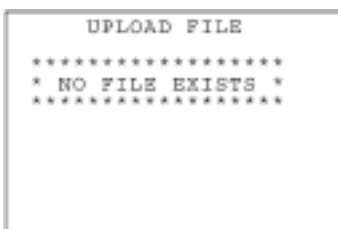
If no file exists in the BHT when you select uploading by FPT, the message shown at left will appear.

Press the **C** key to return to the FTP MENU.

**Run-time messages in downloading/uploading by FTP**

When the BHT is uploading or downloading files by FTP, the following messages will appear in the bottom of the LCD:

| Message | Displays when: |
|---|---|
| Aborted. | Uploading or downloading is interrupted. |
| Connection error | The communications pathway is disconnected. |
| Device error | Failed to open a device. |
| Downloading | Downloading starts. |
| Download failed | Downloading has abnormally ended. |
| Download finished | Downloading has normally ended. |
| File broken! | In uploading, the specified file is broken. |
| File not found! | In downloading, no file is found. |
| File not selected | No file is selected. |
| File type mismatch! | In uploading, the attributes of the file selected in the SELECT FILE entry box are different from those in the DIR/FILE entry box. |
| FTP error | During execution of an FTP command, an error has occurred. |
| FTP opened | Connection is established by FTP. |
| Illegal text format! | The format of a received text is illegal. |
| Opening device | Opening a device. |
| Out of memory! | The memory is insufficient for storing files to be downloaded. |
| Out of range! | The specified parameter(s) is out of the allowable range. |
| Parameter error! | In downloading, the record length and/or field length specified in the FIELDS entry box exceed 255. |
| Program file error! | The received program file is illegal. |
| Routing TCP/IP | Connecting to the TCP/IP communications pathway. |
| Syntax error! | A syntax error has occurred. |
| TCP/IP error | Failed to connect to the TCP/IP communications pathway. |
| TCP socket error | During execution of an FTP command, an error has occurred in the TCP layer. |
| Too many files! | The current download will exceed the allowable number of files in the memory. |
| Uploading | Uploading starts. |
| Upload failed | Uploading has abnormally ended. |
| Upload finished | Uploading has normally ended. |

## Reply codes from the FTP server

The messages that FTP servers send during and after FTP operations vary, but servers all use the same reply codes as listed below.

| Reply codes | Description |
|---|---|
| 110 | Restart marker reply. |
| 120 | Service ready in nnn minutes. |
| 125 | Data connection already open; transfer starting. |
| 150 | File status okay; about to open data connection. |
| 200 | Command okay. |
| 202 | Command not implemented, superfluous at this site. |
| 211 | System status, or system help reply. |
| 212 | Directory status. |
| 213 | File status. |
| 214 | Help message.<br>On how to use the server or the meaning of a particular non-standard command.<br>This reply is useful only to the human user. |
| 215 | NAME system type.<br>Where NAME is an official system name from the list in the Assigned Numbers document. |
| 220 | Service ready for new users. |
| 221 | Service closing control connection.<br>Logged out if appropriate. |
| 225 | Data connection open; no transfer in progress. |
| 226 | Closing data connection.<br>Requested file action successful (for example, file transfer or file abort). |
| 227 | Entering Passive Mode (h1, h2, h3, h4, p1, p2). |
| 230 | User logged in, proceed. |
| 250 | Requested file action okay, completed. |
| 257 | "PATHNAME" created. |
| 331 | User name okay, need password. |
| 332 | Need account for login. |
| 350 | Requested file action pending further information. |
| 421 | Service not available, closing control connection.<br>This may be a reply to any command if the service knows it must shut down. |
| 425 | Can't open data connection. |
| 426 | Connection closed; transfer aborted. |
| 450 | Requested file action not taken.<br>File unavailable (e.g., file busy). |
| 451 | Requested action aborted: local error in processing. |
| 452 | Requested action not taken.<br>Insufficient storage space in system. |
| 500 | Syntax error, command unrecognized.<br>This may include errors such as command line too long. |
| 501 | Syntax error in parameters or arguments. |
| 502 | Command not implemented. |
| 503 | Bad sequence of commands. |
| 504 | Command not implemented for that parameter. |
| 530 | Not logged in. |
| 532 | Need account for storing files. |
| 550 | Requested action not taken.<br>File unavailable (e.g., file not found, no access). |
| 551 | Requested action aborted: page type unknown. |
| 552 | Requested file action aborted.<br>Exceeded storage allocation (for current directory or dataset). |
| 553 | Requested action not taken.<br>File name not allowed. |

# [ 8 ] Deleting Program/Data Files

You may delete a program file or data file stored in the flash ROM.

```
    DELETE FILE

SAMPLE01.PD4
SAMPLE02.PD4
SAMPLE03.PD4
SAMPLE04.PD4
SAMPLE05.PD4
SAMPLE06.PD4
```
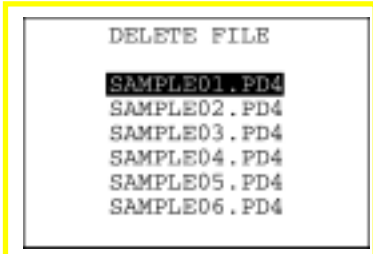
On the SYSTEM MENU, pressing the **0** key with the **SF** key held down calls up the screen shown at left.

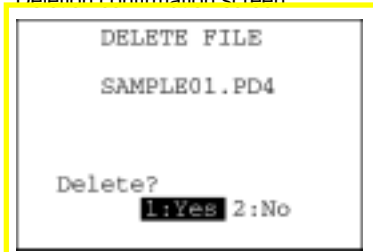Use the **F5** and **F6** keys to move the cursor to the file to be deleted, then press the **ENT** key.
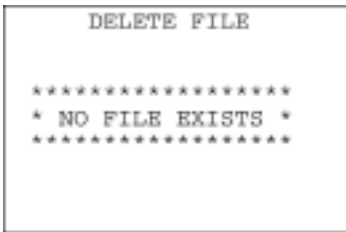
Press the **C** key to return to the SYSTEM MENU.

```
    DELETE FILE


*****************
* NO FILE EXISTS *
*****************
```

If no file is resident in the memory, the message shown at left appears.

Press the **C** key to return to the SYSTEM MENU.

Deletion confirmation screen

```
    DELETE FILE

    SAMPLE01.PD4


Delete?
    1:Yes 2:No
```

Selecting a file to be deleted and pressing the **ENT** key calls up the confirmation screen shown at left.

[1] Yes : Deletes the selected file.

[2] No : Cancels deletion and returns to the previous file selection screen.

Select a desired item by using the numerical keys, then press the **ENT** key.

Deletion completion screen

```
    DELETE FILE


** Completed **
```

Upon completion of deletion, the screen shown at left appears.

Press the **C** key to return to the file selection screen.

# [ 9 ]　Deleting Font Files

You may delete font files stored in the flash ROM if you do not need to display Japanese fonts (16-dot and/or 12-dot fonts) and the user area is insufficient. Deleting those font files allows the memory area which was occupied by those files to be used as a user area.

Before deleting font files, be sure to upload them to the host PC and back them up for the future use.

```
     DELETE FILE

  FNT16J1.FN3
  FNT16J2.FN3
  FNT12J1.FN3
  FNT12J2.FN3
```

On the SYSTEM MENU, pressing the **2** key with the **SF** key held down calls up the screen shown at left.

Use the **F5** and **F6** keys to move the cursor to the font file to be deleted, then press the **ENT** key.

Press the **C** key to return to the SYSTEM MENU.

```
     DELETE FILE


  *****************
  * NO FILE EXISTS *
  *****************
```
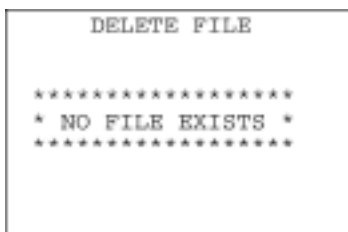
If no font file is resident in the memory, the message shown at left appears.

Press the **C** key to return to the SYSTEM MENU.

Deletion confirmation screen

```
     DELETE FILE

     FNT16J1.FN3


  Delete?
       1:Yes  2:No
```

Selecting a font file and pressing the **ENT** key calls up the confirmation screen shown at left.

[1] Yes :　Deletes the selected font file.

[2] No :　Cancels deletion and returns to the previous file selection screen.

Select a desired item by using the numerical keys, then press the **ENT** key.

Deletion completion screen

```
     DELETE FILE


  ** Completed **
```
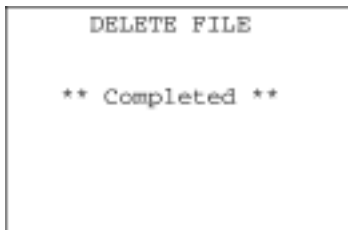
Upon completion of deletion, the screen shown at left appears.

Press the **C** key to return to the file selection screen.

# [ 10 ]  Downloading/Uploading the BHT System Parameter File

The BHT system parameter file (named "_BHT.SYS") stores system environment settings specified in the SET SYSTEM menu (in Section 2.5.3, [ 4 ]) and other settings such as the LCD contrast and beeper volume.

The SYSTEM PARAMETER transfer menu allows you to upload or download the BHT system parameter file to/from the host PC. This makes it possible to copy the settings made in a single BHT onto other BHTs. First, make settings in a particular BHT and upload the BHT system parameter file to the host PC by using this menu ("2: UPLOAD"). Next let other BHTs download the file from the host PC by using this menu ("1: DOWNLOAD").

TIP  Without the host PC, you may directly copy the BHT system parameter file between two BHTs (one BHT runs UPLOAD and the other, DOWNLOAD). For the preparation to be made beforehand, refer to ▊▊ on page 44.

If you select the "2: UPLOAD," the system will set up the BHT system parameter file based on the current settings and upload it to the host PC. After that, the created file will be deleted.

If you select the "1: DOWNLOAD," the BHT will receive the BHT system parameter file from the host PC and read in the values stored in the file. After that, the received file will be deleted.

For uploading/downloading, the BHT will use the communications parameters, communications protocol, and interface port specified in Section 2.5.3, "[4.5] Setting the communications environments."

SYSTEM PARAMETER transfer menu

```
    SYSTEM PARAMETER

     1:DOWNLOAD

     2:UPLOAD
```

On the SYSTEM MENU, pressing the **3** key with the **SF** key held down calls up the screen shown at left.

[1] DOWNLOAD:  Downloads the BHT system parameter file to the user area of the BHT.

[2] UPLOAD:  Uploads the BHT system parameter file stored in the BHT.

Select a desired item by using the numerical keys or **F5** and **F6** keys, then press the **ENT** key.

Press the **C** key to return to the SYSTEM MENU.

## [10.1]  Downloading the BHT system parameter file

```
        DOWNLOAD


     ** Waiting **
```

Selecting "1: DOWNLOAD" on the SYSTEM PARAMETER transfer menu calls up the screen shown at left. With this screen displayed, the BHT waits for the BHT system parameter file to be downloaded.

⇓

```
        DOWNLOAD

       _BHT.SYS
     ** Loading **

      XXXXX/YYYYY
```

While the downloading operation is in progress, the screen shown at left is displayed indicating the file name and the number of received records/the total number of records.

To abort the downloading operation, press the **C** key. The screen will switch back to the SYSTEM PARAMETER transfer menu.

⇓

```
        DOWNLOAD

       _BHT.SYS
     ** Completed **
```

Upon completion of downloading, the BHT displays the screen shown at left and beeps once.

Press the **C** key to return to the SYSTEM PARAMETER transfer menu.

## If an error occurs during downloading

If some error occurs during downloading, the BHT beeps three times and shows one of the following screens with the prompt "Retry?":

To retry the download, press the **1** and **ENT** keys; to abort it, press the **2** and **ENT** keys.

To return to the SYSTEM PARAMETER transfer menu, press the **C** key.

```
       DOWNLOAD


    Out of memory!!


   Retry?
        1:Yes 2:No
```

#### ■ Problem

The memory is insufficient for storing the BHT system parameter file to be downloaded.

#### ■ Solution

Press the **2** key to return to the SYSTEM MENU, then delete unnecessary files in the memory. (Refer to Section 2.5.3, [ 8 ].)

```
       DOWNLOAD


    File mismatch!!


   Retry?
        1:Yes 2:No
```

#### ■ Problem

You attempted to download a file other than the BHT system parameter file.

#### ■ Solution

Check whether the file you attempted to download is the BHT system parameter file.

```
       DOWNLOAD


    Too many files!!


   Retry?
        1:Yes 2:No
```

#### ■ Problem

The current download will exceed the maximum allowable number of files (120 files) in the memory.

#### ■ Solution

Press the **2** key to return to the SYSTEM MENU, then delete unnecessary files in the memory. (Refer to Section 2.5.3, [ 8 ].)

```
       DOWNLOAD
         _BHT.SYS
   Communication error!!


   Retry?
        1:Yes 2:No
```

#### ■ Problem

Downloading has failed.

#### ■ Solution

To retry downloading, press the **1** key.

To return to the SYSTEM MENU, press the **2** key. Check the interface port, communications parameters and communications protocol type in the SET SYSTEM menu or perform the communications test in the TEST menu. (Refer to Section 2.5.3, [4.5] and [5.7].)

It is also necessary to check the communications parameters setup of the host PC.

## [10.2]  Uploading the BHT system parameter file

```
      UPLOAD


   ** Waiting **
```

Selecting "2: UPLOAD" on the SYSTEM PARAMETER transfer menu calls up the screen shown at left. With this screen displayed, the BHT waits for the BHT system parameter file to be uploaded.

⇓

```
      UPLOAD

    _BHT.SYS
   ** Loading **

   XXXXX/YYYYY
```

While the uploading operation is in progress, the screen shown at left is displayed indicating the file name and the number of sent records/the total number of records.

To abort the uploading operation, press the **C** key. The screen will switch back to the SYSTEM PARAMETER transfer menu.

⇓

```
      UPLOAD

    _BHT.SYS
   ** Completed **
```

Upon completion of uploading, the BHT displays the screen shown at left and beeps once.

Press the **C** key to return to the SYSTEM PARAMETER transfer menu.

## If an error occurs during uploading

If some error occurs during uploading, the BHT beeps three times and shows one of the following screens:

To retry the uploading operation, press the **1** and **ENT** keys; to abort it, press the **2** and **ENT** keys.

Press the **C** key to return to the SYSTEM PARAMETER transfer menu.

```
        UPLOAD

    Out of memory!!
```

### ■ Problem

The memory is insufficient for setting up the BHT system parameter file to be uploaded.

### ■ Solution

Press the **C** key to return to the SYSTEM MENU, then delete unnecessary files in the memory. (Refer to Section 2.5.3, [ 8 ].)

```
        UPLOAD

    Too many files!!
```

### ■ Problem

The memory has already contained 120 files, so the BHT system parameter file cannot be set up.

### ■ Solution

Press the **C** key to return to the SYSTEM MENU, then delete unnecessary files in the memory. (Refer to Section 2.5.3, [ 8 ].)

```
        UPLOAD
        _BHT.SYS
    Communication error!!

    Retry?
         1:Yes 2:No
```

### ■ Problem

Uploading has failed.

### ■ Solution

To retry uploading, press the **1** key.

To return to the SYSTEM MENU, press the **2** key. Check the interface port, communications parameters, and communications protocol type in the SET SYSTEM menu or perform the communications test in the TEST menu. (Refer to Section 2.5.3, [4.5] and [5.7].)

It is also necessary to check the communications parameters setup of the host PC.

# [ 11 ]  Setting the Remote Wakeup

```
SET REMOTE WAKEUP

1:REMOTE WAKEUP
    ON      OFF

2:TRANSMIT SPEED
    9600   19200  38400
    57600  115200
```

On the SYSTEM MENU, pressing the **4** key with the **SF** key held down calls up the screen shown at left.

[1] REMOTE WAKEUP: Activates or deactivates the remote wakeup function.

[2] TRANSMIT SPEED: Sets the transmission speed for the remote wakeup.

Select a desired item by using the numerical keys or **F5** and **F6** keys. Select a desired setting by using the **F7** and **F8** keys, and then press the **ENT** key.

To return to the SYSTEM MENU, press the **C** key.

# [ 12 ]  Downloading/Uploading the System Message File

The system message file (named "_B30MSG.FN3") stores system messages, e.g., "Shutdown in progress. Do not remove the battery." and "Charge the battery!."

The SYSTEM MESSAGE transfer menu allows you to upload or download the system message file to/from the host PC.

If you select the "2: UPLOAD," the system will set up the system message file based on the current settings and upload it to the host PC. After that, the created file will be deleted.

If you select the "1: DOWNLOAD," the BHT will receive the system message file from the host PC and read in the messages stored in the file. After that, the received file will be deleted.

For uploading/downloading, the BHT will use the communications parameters, communications protocol, and interface port specified in Section 2.5.3, "[4.5] Setting the communications environments."

TIP   Usually you do not need to use the SYSTEM MESSAGE transfer menu since system messages have been set up at the time of delivery from the factory.

SYSTEM MESSAGE transfer menu

```
SYSTEM MESSAGE

1:DOWNLOAD

2:UPLOAD
```

On the SYSTEM MENU, pressing the **6** key with the **SF** key held down calls up the screen shown at left.

[1] DOWNLOAD:  Downloads the system message file to the user area of the BHT.

[2] UPLOAD:  Uploads the system message file stored in the BHT.

Select a desired item by using the numerical keys or **F5** and **F6** keys, then press the **ENT** key.

Press the **C** key to return to the SYSTEM MENU.

## [12.1] Downloading the system message file

```
        DOWNLOAD

     ** Waiting **
```

Selecting "1: DOWNLOAD" on the SYSTEM MESSAGE menu calls up the screen shown at left. With this screen displayed, the BHT waits for the system message file to be downloaded.

⇓

```
        DOWNLOAD

     _B30MSG.FN3
     ** Loading **

   XXXXXXX/YYYYYYY
```

While the downloading operation is in progress, the screen shown at left is displayed indicating the file name and the number of received records/the total number of records.

To abort the downloading operation, press the **C** key. The screen will switch back to the SYSTEM MESSAGE transfer menu.

⇓

```
        DOWNLOAD

     _B30MSG.FN3
     ** Completed **
```

Upon completion of downloading, the BHT displays the screen shown at left and beeps once.

Press the **C** key to return to the SYSTEM MESSAGE transfer menu.

NOTE　When the BHT downloads the system message file, it creates a temporary file named "_B30MSG.FN3" in the user area. If the user area is insufficient for creating the temporary file, therefore, an error will result.

The created temporary file will be automatically deleted after completion of downloading.

## If an error occurs during downloading

If some error occurs during downloading, the BHT beeps three times and shows one of the following screens with the prompt "Retry?":

To retry the download, press the **1** and **ENT** keys; to abort it, press the **2** and **ENT** keys.

To return to the SYSTEM MESSAGE transfer menu, press the **C** key.

```
      DOWNLOAD


   Out of memory!!


   Retry?
          1:Yes 2:No
```

**■ Problem**

The memory is insufficient for storing the system message file to be downloaded.

**■ Solution**

Press the **2** key to return to the SYSTEM MENU, then delete unnecessary files in the memory. (Refer to Section 2.5.3, [ 8 ].)

```
      DOWNLOAD


   File mismatch!!


   Retry?
          1:Yes 2:No
```

**■ Problem**

You attempted to download a file other than the system message file.

**■ Solution**

Check whether the file you attempted to download is the system message file.

```
      DOWNLOAD


   Too many files!!


   Retry?
          1:Yes 2:No
```

**■ Problem**

The current download will exceed the maximum allowable number of files (120 files) in the memory.

**■ Solution**

Press the **2** key to return to the SYSTEM MENU, then delete unnecessary files in the memory. (Refer to Section 2.5.3, [ 8 ].)

```
      DOWNLOAD

      _B30MSG.FN3
   Communication error!!


   Retry?
          1:Yes 2:No
```

**■ Problem**

Downloading has failed.

**■ Solution**

To retry downloading, press the **1** key.

To return to the SYSTEM MENU, press the **2** key. Check the interface port, communications parameters, and communications protocol type in the SET SYSTEM menu or perform the communications test in the TEST menu. (Refer to Section 2.5.3, [4.5] and [5.7].)

It is also necessary to check the communications parameters setup of the host PC.

## [12.2]  Uploading the system message file

```
      UPLOAD


   ** Waiting **
```

Selecting "2: UPLOAD" on the SYSTEM MESSAGE transfer menu calls up the screen shown at left. With this screen displayed, the BHT waits for the system message file to be uploaded.

⇓

```
      UPLOAD

    _B30MSG.FN3
   ** Loading **

  XXXXXXX/YYYYYYY
```

While the uploading operation is in progress, the screen shown at left is displayed indicating the file name and the number of sent records/the total number of records.

To abort the uploading operation, press the **C** key. The screen will switch back to the SYSTEM MESSAGE transfer menu.

⇓

```
      UPLOAD

    _B30MSG.FN3
   ** Completed **
```

Upon completion of uploading, the BHT displays the screen shown at left and beeps once.

Press the **C** key to return to the SYSTEM MESSAGE transfer menu.

NOTE    When the BHT uploads the system message file, it creates a temporary file named "_B30MSG.FN3" in the user area. If the user area is insufficient for creating the temporary file, therefore, an error will result.

The created temporary file will be automatically deleted after completion of uploading.

### If an error occurs during uploading

If some error occurs during uploading, the BHT beeps three times and shows one of the following screens:

To retry the uploading operation, press the **1** and **ENT** keys; to abort it, press the **2** and **ENT** keys.

Press the **C** key to return to the SYSTEM MESSAGE transfer menu.

```
        UPLOAD


   Out of memory!!
```

■ **Problem**

The memory is insufficient for setting up the system message file.

■ **Solution**

Press the **C** key to return to the SYSTEM MENU, then delete unnecessary files in the memory. (Refer to Section 2.5.3, [ 8 ].)

```
        UPLOAD


   Too many files!!
```

■ **Problem**

The memory has already contained 120 files, so the BHT system message file cannot be set up.

■ **Solution**

Press the **C** key to return to the SYSTEM MENU, then delete unnecessary files in the memory. (Refer to Section 2.5.3, [ 8 ].)

```
        UPLOAD

      _B30MSG.FN3
   Communication error!!


   Retry?
        1:Yes 2:No
```

■ **Problem**

Uploading has failed.

■ **Solution**

To retry uploading, press the **1** key.

To return to the SYSTEM MENU, press the **2** key. Check the interface port, communications parameters, and communications protocol type in the SET SYSTEM menu or perform the communications test in the TEST menu. (Refer to Section 2.5.3, [4.5] and [5.7].)

It is also necessary to check the communications parameters setup of the host PC.

# [ 13 ]  Updating the Systems

```
    MODIFY MENU

1:SYSTEM MODIFY

2:CU-F/W MODIFY
```
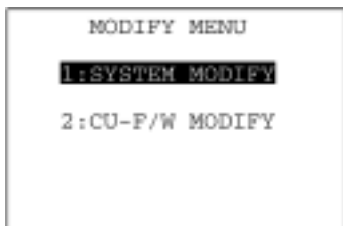
On the SYSTEM MENU, pressing the period (.) key with the **SF** key held down calls up the screen shown at left.

[1] SYSTEM MODIFY: Switches to the BHT system updating menu.

[2] CU-F/W MODIFY: Switches to the CU-311 system updating menu (in LAN-support software only).

Select a desired item by using the numerical keys or **F5** and **F6** keys, and then press the **ENT** key.

To return to the SYSTEM MENU, press the **C** key.

## [13.1]  Updating the BHT system

Before proceeding to the updating procedure, you need to download a BHT system reconfig file, referring to Section 2.6.1.

```
    SYSTEM MODIFY

1:DO IT

2:FILENAME

 [XXXXXXXXXXXX ]
```

On the MODIFY MENU, selecting "1: SYSTEM MODIFY" calls up the screen shown at left.

[1] DO IT:  Starts updating the current BHT system.

[2] FILENAME: The filename to be used for updating the BHT system will be displayed.

If it is different from the name of the BHT system reconfig file you have downloaded, you may specify the correct filename here. (For details, refer to the next page.)

Select a desired item by using the numerical keys or **F5** and **F6** keys, and then press the **ENT** key.

```
    SYSTEM MODIFY


   ** Working **
```
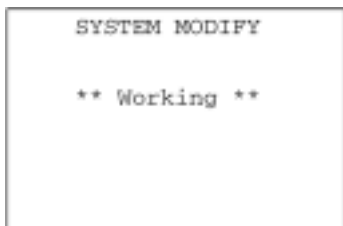
Selecting "1: DO IT" calls up the screen shown at left. With this screen displayed, the BHT immediately starts updating the current BHT system.

Upon completion of updating, the BHT will automatically turn itself off.

If the displayed filename is different from the name of the BHT system reconfig file you want to use, then select "2: FILENAME" and enter the correct filename.

Selecting "2: FILENAME" makes the entry box ready to accept entry and displays a cursor. Enter the desired filename by using the numerical keys and period (.) key, and then press the **ENT** key.

Pressing the **SF** key switches the entry mode between the numeric mode and alphabet mode.

In the entry mode, to delete a single character, press the **BS** key. To delete the whole entry you made, press the **C** key.

To return to the MODIFY MENU, press the **C** key when any item is highlighted.

### If no BHT system reconfig file exists at the start of updating

```
      SYSTEM MODIFY


*****************
* NO FILE EXISTS *
*****************
```
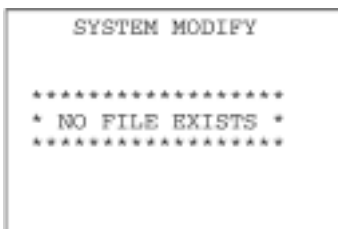
If no BHT system reconfig file exists in the BHT when you select "1: DO IT," then the message shown at left will appear.

Download a BHT system reconfig file to the BHT and then try updating again. (Refer to Section 2.6.1.)

Press the **C** key to return to the MODIFY MENU.

## [13.2] Updating the CU-311 System via the BHT (in LAN-support software only)

Before proceeding to the updating procedure, you need to download a CU-311 system reconfig file, referring to Section 2.6.2.

```
CU-F/W MODIFY

1:DO IT
2:FILENAME
 [C3NDN.DAT      ]
```

On the MODIFY MENU screen (that can be called up by pressing the period (.) key with the **SF** key held down on the SYSTEM MENU), selecting "2: CU-F/W MODIFY" calls up the menu screen shown at left.

[1] DO IT:        Updates the current CU-311 system.

[2] FILENAME:   Allows you to enter the filename of a CU-311 system reconfig file that you want to send to the CU-311.

Select a desired item by using the numerical keys or **F5** and **F6** keys, and then press the **ENT** key.

To specify a CU-311 system reconfig file to be sent, select "2: FILENAME." The entry box becomes ready to accept entry and a cursor appears. Enter the desired value by using the numerical keys and period (.), and then press the **ENT** key.

Pressing the **SF** key switches the entry mode between the numeric mode (without a guidance) and alphabet mode.

In the entry mode, to delete a single character, press the **BS** key. To delete the whole entry you made, press the **C** key.

Updating the CU-311 System

```
CU-F/W MODIFY

** Working **
```

To start updating, select "1: DO IT." While displaying the screen shown at left, the BHT starts updating the current CU-311 system.

⇓

(CU system updating completion screen)

```
CU-F/W MODIFY

** Completed **
VERSION : X.XX
MAC ADDRESS :
   XXXXXXXXXXXX
```

If the CU-311 system updating completes normally, the screen shown at left will appear.

To return to the CU-F/W MODIFY menu screen, press the **C** key.

**If no CU-311 system reconfig file exists at the start of updating**

```
     CU-F/W MODIFY

*****************
* NO FILE EXISTS *
*****************
```

If no system file exists in the BHT when you select "1: DO IT," then the message shown at left will appear.

Download a CU-311 system reconfig file to the BHT and then try updating again. (Refer to Section 2.6.2.)

To return to the CU-F/W MODIFY menu screen, press the **C** key.

**If no BHT is placed on the CU-311 at the start of updating**

```
     CU-F/W MODIFY

This BHT is not set
       on the CU.
```

If no BHT is placed on the CU-311 when you select "1: DO IT," then the message shown at left will appear.

Place the BHT on the CU-311 and then try updating again. (Refer to Section 2.6.2.)

To return to the CU-F/W MODIFY menu screen, press the **C** key.

**If an updating error occurs**

```
     CU-F/W MODIFY

*****************
*  MODIFY ERROR  *
*****************
```

If any updating error occurs during updating that is started by selecting "1: DO IT," then the message shown at left will appear.

Check that the BHT is placed on the CU-311 correctly and then try updating again. (Refer to Section 2.6.2.)

To return to the CU-F/W MODIFY menu screen, press the **C** key.

# 2.6 Downloading System Reconfig Files and Updating the Current Systems

## 2.6.1 Updating the BHT System

You may update the current BHT system in System Mode in the following two processes.

### (1) Download a BHT system reconfig file to the BHT from the host PC

Download a BHT system reconfig file by using the BHT's downloading function—the DOWNLOAD menu or FTP MENU.

### (2) Update the current BHT system

Use the BHT system updating menu (SYSTEM MODIFY) to update the BHT system.

Upon completion of updating, the BHT will automatically turn itself off. (Refer to Section 2.5.3, [13.1].)

**IMPORTANT**
To avoid a low-battery problem during the system updating operation, ensure that the BHT has sufficient battery power or keep the BHT placed on the CU.

Even if the BHT is shut down during the operation due to a low-battery problem, turning it on can resume the system updating operation.

During system updating, the **PW** key is disabled so that the BHT cannot be turned off. Wait for completion of updating and then press the **PW** key.

**TIP**
The latest BHT system reconfig file can be downloaded from our Web site.

http://www.denso-wave.com/

# 2.6.2 Updating the CU-311 System (in LAN-support software only)

You may update the current CU-311 system via the BHT in the following two processes.

### (1) Download a CU-311 system reconfig file to the BHT from the host PC

Download a CU-311 system reconfig file as a data file having the field length of 64 bytes, by using the BHT's downloading function—the DOWNLOAD menu or FTP MENU.

| IMPORTANT | When downloading a CU-311 system reconfig file with BHT-BASIC4.0 Transfer Utility according to the BHT-protocol, be sure to select the "Binary File Transfer" check box in the "Options for Communications" dialog box beforehand. |

### (2) Update the current CU-311 system

Place the BHT on the CU-311 and use the CU-311 system updating menu (CU-F/W MODIFY) to update the current CU system. (For the detailed procedure, refer to Section 2.5.3, [13.2].)

During updating, the POWER LED on the CU-311 will flash. (For details, refer to Section 5.6.1.)

| IMPORTANT | During updating, do not remove the BHT from the CU-311 or turn the BHT off. Doing so will cause a CU-311 system updating error, making the CU-311 wait for retry.

To recover from such status, carry out the updating procedure again or restart the CU-311. |

| NOTE | If the CU-311 has been turned off during updating, restarting it will run either the old CU-311 system or updated one. You may check which system is running on the CU INFORMATION screen given in Section 2.5.3, [ 6 ]. |

| TIP | The latest CU-311 system reconfig file can be downloaded from our Web site.

http://www.denso-wave.com/ |

# 2.7  Starting Up User Programs

You may start up user programs (application programs) in the BHT in several ways. This section outlines those ways.

■ **Starting from the EXECUTE PROGRAM menu in System Mode**

If you select a desired user program as an execution program in the EXECUTE PROGRAM menu, then the selected program will immediately start running. The selected program will always start from the beginning.

For details, refer to Section 2.5.3, "[ 1 ] Program Execution."

■ **Starting the auto-start execution program selected in the SET SYSTEM menu in System Mode, by turning the power on**

If you have selected a desired user program as an auto-start execution program on the SET EXECUTE PROGRAM screen in the SET SYSTEM menu and turned the BHT off, then turning the BHT on will automatically run the selected program. If the resume function is activated, turning the BHT on will resume the program at the current point that had been running before the BHT was turned off.

For details, refer to Section 2.5.3, "[4.1] Setting an auto-start execution program."

■ **Starting the first registered execution program, by turning the power on--with Directory Manager**

If no auto-start execution program has been selected on the SET EXECUTE PROGRAM screen in the SET SYSTEM menu, then turning the BHT on will transfer the control to Directory Manager that starts a first-registered one out of user programs (.PD4) loaded in the BHT.

If the resume function is activated, turning the BHT on will resume the program at the current point that had been running before the BHT was turned off.

When downloading more than one user program after system initialization, you should download first a desired program to be run as an auto-start execution program since downloaded programs will be registered in the system in the downloading order.

At the time of updating programs, use the same program names in downloading, and the registration order of programs will not change so that the same execution program will be able to run.

**NOTE:** Directory Manager in system manages also files other than program files (.PD4). If you delete a non-program file (e.g., .DAT) registered preceding the first-registered execution program and download a new user program, then the newly downloaded program will be registered into the position of the deleted non-program file. To prevent such a problem, it is recommended that after initialization you first download an execution program to be run first when the BHT is turned on.

On the next page are downloading examples and Directory Manager control. In those samples, the following file names are used:

| | |
|---|---|
| MAIN.PD4 | Program to be run by pressing the **PW** key |
| SUBMAIN.PD4 | Program chained from the MAIN.PD4 with the CHAIN statement in BHT-BASIC |
| USER.PD4 | New user program |
| AAAAAAAA.DAT | Data file 1 to be used by user programs |
| BBBBBBBB.DAT | Data file 2 to be used by user programs |

Example 1: Downloading updated versions of the MAIN.PD4 and SUBMAIN.PD4

In this case, the registration order of user programs will not change, so pressing the **PW** key will start the MAIN.PD4.

| Directory information |
| --- |
| AAAAAAAA.DAT |
| BBBBBBBB.DAT |
| MAIN.PD4 |
| SUBMAIN.PD4 |
| . . . |

• MAIN.PD4 (Newer version)
• SUBMAIN.PD4 (Newer version)

DOWNLOAD

| Directory information |
| --- |
| AAAAAAAA.DAT |
| BBBBBBBB.DAT |
| MAIN.PD4 |
| SUBMAIN.PD4 |
| . . . |
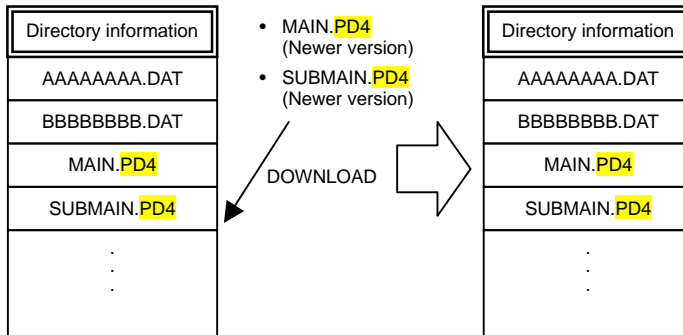
Example 2: Deleting the BBBBBBBB.DAT and downloading new USER.PD4

In this case, the USER.PD4 will be registered into the position of the deleted BBBBBBBB.DAT so that the USER.PD4 will become an execution program to be run when the **PW** key is pressed.

| Directory information |
| --- |
| AAAAAAAA.DAT |
| BBBBBBBB.DAT |
| MAIN.PD4 |
| SUBMAIN.PD4 |
| . . . |

DELETE

DOWNLOAD

USER.PD4

| Directory information |
| --- |
| AAAAAAAA.DAT |
| USER.PD4 |
| MAIN.PD4 |
| SUBMAIN.PD4 |
| . . . |
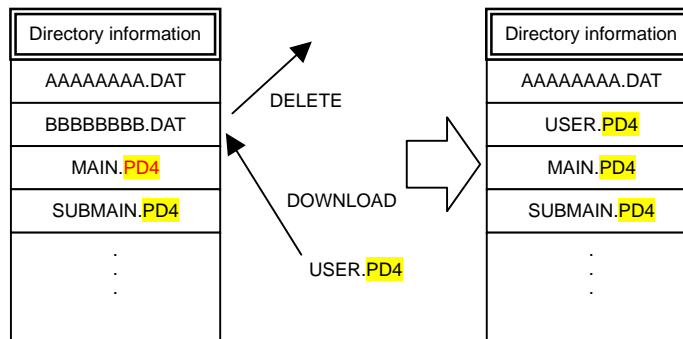
Example 3: Recommended downloading order

After system initialization, download first an execution program you want to run by pressing the **PW** key. As long as you do not delete the execution program or download any other program, the execution program is always registered in the top of the directory.

| Directory information |
| --- |
| |
| |
| |
| . . . |
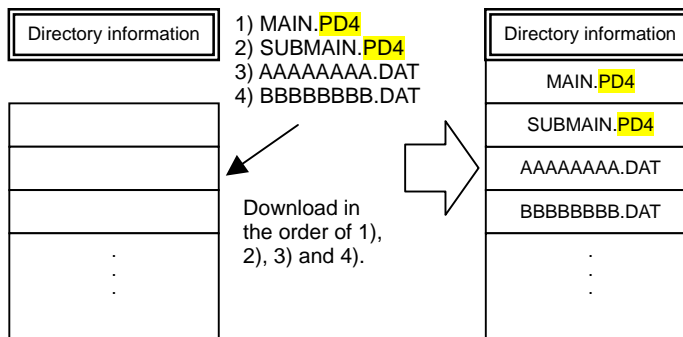
Memory state after system initialization

1) MAIN.PD4
2) SUBMAIN.PD4
3) AAAAAAAA.DAT
4) BBBBBBBB.DAT

Download in the order of 1), 2), 3) and 4).

| Directory information |
| --- |
| MAIN.PD4 |
| SUBMAIN.PD4 |
| AAAAAAAA.DAT |
| BBBBBBBB.DAT |
| . . . |

## ■ Starting with the wakeup function

If you specify the wakeup time in user programs, the wakeup function will automatically wake up the BHT at the specified time and run a user program.

If an auto-start execution program has been selected on the SET EXECUTE PROGRAM screen in the SET SYSTEM menu, the selected program will run at the time of wakeup. If no auto-start execution program has been specified, the control will be transferred to Directory Manager that starts a first-registered one out of user programs (.PD4) loaded in the BHT.

For details about the wakeup function, refer to the BHT-BASIC Programmer's Manual.


## ■ Starting with the remote wakeup function

If the remote wakeup function is activated, the BHT will wake up upon receipt of the specified control command from the host PC. At the time of wakeup, if the BHTRMT.PD4 file exists in the BHT, the BHTRMT.PD4 will execute.

Therefore, if a user program is chained to the BHTRMT.PD4 by using the CHAIN statement in BHT-BASIC, then the chained-to user program will run at the time of remote wakeup.

For details about the remote wakeup, refer to Section 2.5.3, "[ 11 ] Setting the Remote Wakeup" and the BHT-BASIC Programmer's Manual.

# Chapter 3

# Communications Operations of BHT

This chapter outlines the BHT's communications capabilities necessary for performing data and program transfer between the BHT-300B and host PC or other devices: infrared (Ir) communication, RS-232C interface specifications, and the basic communications specifications.

# 3.1　Infrared Communication

The BHT has an integrated infrared communications unit which enables wireless transfer of programs and data between a BHT and a host PC and between two BHTs.

The IR communications device features the following:

- Wireless communications
- Small and lightweight design
- High transmission speed
- Freedom from the codes/regulations and licenses which differ from country to country, unlike radio devices

The BHT can communicate with other IrDA-compliant equipment just by aligning their IrDA ports with each other. The effective IR range and IrDA port angle differ depending upon the target equipment, so observe the instructions given in manuals furnished with such equipment.

NOTE　If IR transfer fails, bring the BHT closer to the target station or change the IrDA port angle, and try again.

The BHT's IR communications device is IrDA-compliant. IrDA stands for Infrared Data Association, which has defined hardware (IrDA Serial Infrared Physical Layer Link) and communications protocols for IR communications.

The BHT's physical layer complies with the IrDA1.2 Low Power, with a maximum transfer distance of 0.15 m and maximum transmission rate of 115.2 kbits per second.

The BHT supports three communications protocols--YMODEM, BHT-Ir protocol and BHT-protocol.
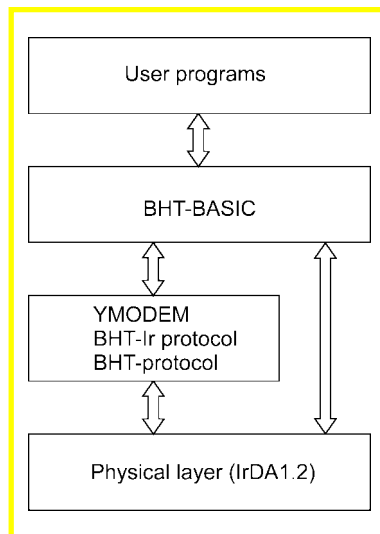
# 3.2  RS-232C Interface Specifications

## [ 1 ]  Interface Connector and Pin Assignment

The BHT has a direct-connect interface port which is connectable to the 3-pole mini stereo plug (φ2.5 mm or 0.1") and supports a subset of the RS-232C interface as shown below.

Using a direct-connect interface cable having the mini stereo plugs makes it possible to connect the BHT to a host PC (or another BHT) directly without any routing through the CU-300.
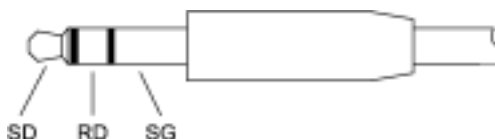


**3-pole Mini Stereo Plug (ø2.5 mm or 0.1")**

The poles of the plug are assigned as listed below.

| Signal Name | Function | Signal Input/Output | |
| --- | --- | --- | --- |
| | | BHT | External device |
| SD | Send data | $\rightarrow$ | |
| RD | Receive data | $\leftarrow$ | |
| SG | Signal ground | - | |

The input/output voltage threshold for the logical valued signal is listed below.

| Logical Value | Input Voltage Threshold (RD) | Output Voltage Threshold (SD) |
| --- | --- | --- |
| 0 | 3V min. | 5V min. |
| 1 | -3V max. | -5V max. |

NOTE  The direct-connect interface port is not designed to stand frequent connecting/disconnecting. Do not plug and unplug basically more than one time a day; otherwise, the service life of the plug will shorten. To connect the BHT to a host PC having no IrDA port (or another BHT) frequently, use the CU-300.

NOTE  Allow the specified signals only to enter the direct-connect interface port. Entry of other signals will result in a failure or malfunction of the BHT.

# [ 2 ]    Interface Cable Connection

Connect the BHT directly to a host PC, a modem, or a printer with a direct-connect interface cable as illustrated below.
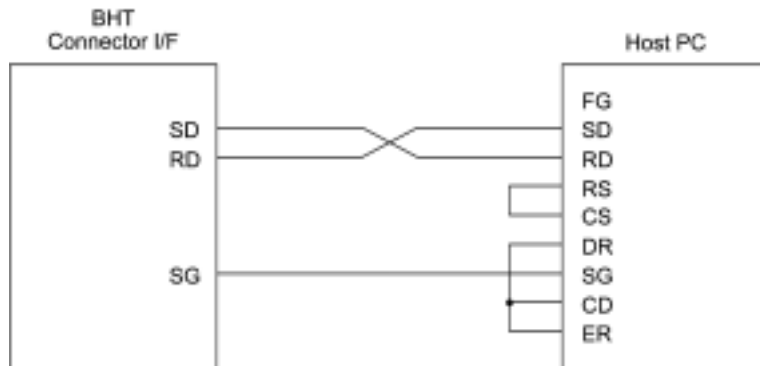


**Cable Connection between BHT and Host PC**
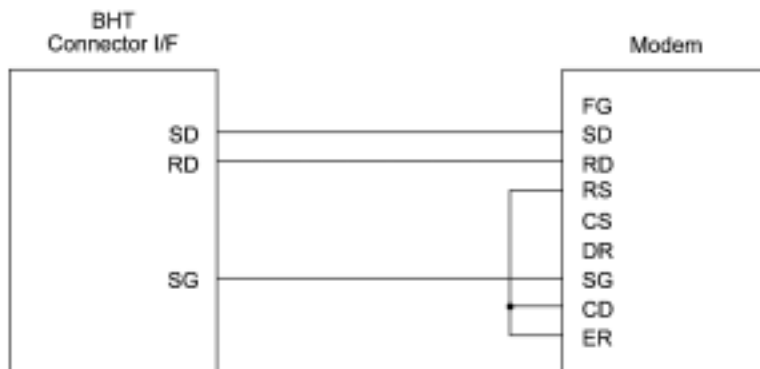


**Cable Connection between BHT and Modem**
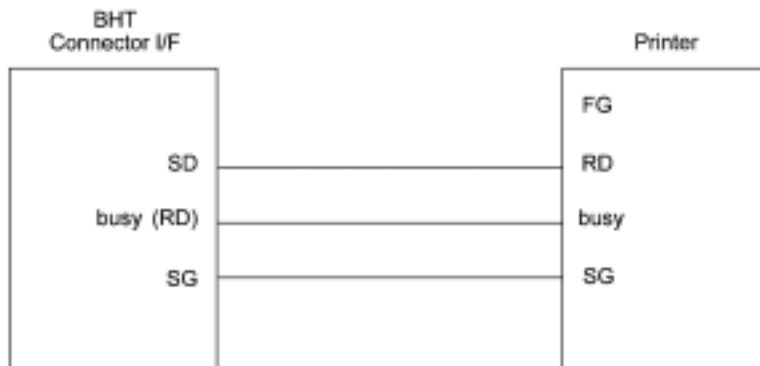


**Cable Connection between BHT and Printer**

# 3.3 Basic Communications Specifications and Parameters

## 3.3.1 Basic Communications Specifications

Listed below are the communications specifications when the BHT exchanges data with a host PC through the IrDA interface or direct-connect interface.

| | IrDA Interface | Direct-connect Interface |
|---|---|---|
| Synchronization | Start-stop | |
| Transmission Speed | 2400, 9600, 19200, 38400, 57600, or 115200 bps | 300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, or 115200 bps |
| Transmission Code | JIS 8-bit codes | JIS 7- or 8-bit codes |
| Transmission Bit Order | LSB (Least significant bit) first | |
| Vertical Parity | None | Even, odd, or none |

### ■ Synchronization

For accurate data transaction, it is very important to synchronize the transmission between the sender and receiver. To do this, it is required to previously define the bit order and position, the character length, and the beginning and end of the character to be transmitted.

The start-stop synchronization is an asynchronous system which synchronizes each character as a unit; that is, it externally adds start and stop bits to the leading and trailing bit positions of the character to be transmitted, respectively. A clock starts counting on receiving the start bit and it falls into a non-communication state on receiving the stop bit. The number of the stop bits is selectable (1 or 2 bits).

### ■ Transmission Speed

Maximum number of bits to be transmitted per second. Expressed in bps (bits per second).

### ■ IrDA Interface Communications Range

The IrDA interface's maximum effective range is 15 cm (5.9 in.) with the IR beam within a 10° angle of divergence.

To communicate via the CU-300, put the BHT on the CU-300.

### ■ Switching Time between Sending and Receiving on IrDA Interface

The IrDA interface should satisfy the following requirements in switching between sending and receiving:

(1) Within 10 ms from completion of sending, the IrDA interface should become ready to receive.

(2) After 10 ms or more from completion of receiving, the IrDA interface should start sending.

■ **Transmission Code and Bit Order**

All characters should be coded to 7- or 8-bit code for data transmission. The standard data exchange code of the BHT is JIS 7- or 8-bit code. The transmission bit order is LSB (Least significant bit) first.

What follows is an example for transmitting character A (41h, 01000001b) coded to JIS 8-level code with an even parity and a single bit each for start and stop bits.



■ **Vertical Parity**

A vertical parity bit is a redundancy bit which is added to every character to be transmitted in order to check that data has been transmitted accurately. The parity bit should be set to "1" or "0" depending upon the parity parameter setting, to make the number of set bits in the character even or odd. The receiver counts the number of set bits in the transmitted character code to make sure that it has the selected number (even or odd) of set bits.

The vertical parity bit is positioned immediately following the MSB (Most significant bit) as shown below.
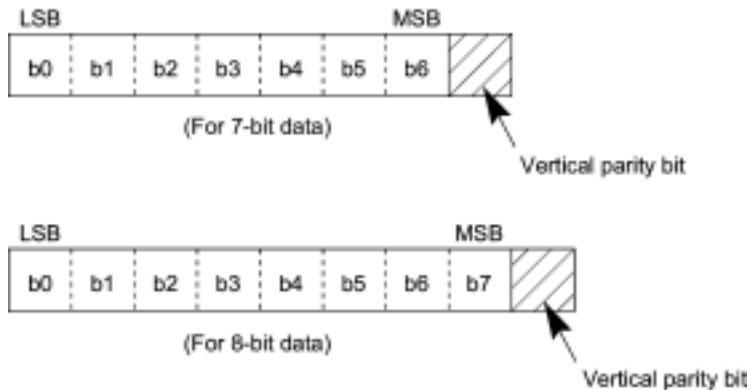
# 3.3.2　Communications Parameters

In System Mode and user programs written in BHT-BASIC, you can set the communications parameters listed below.

| Communications Port | IrDA interface | Direct-connect interface |
|---|---|---|
| Transmission Speed | 2400, 9600, 19200, 38400, 57600, or 115200 bps | 300, 600, 1200, 2400, 4800, 9600, 9200, 38400, 57600, or 115200 bps |
| Character Length | 8 bits | 7 or 8 bits |
| Vertical Parity | None | Odd, even, or none |
| Stop Bit Length | 1 bit | 1 or 2 bits |

## In System Mode

Refer to Chapter 2, Section 2.5.3, [4.5], "Setting the communications environments."

## In BHT-BASIC

To set the transmission speed, character length, vertical parity, and stop bit length (For the IrDA interface, set the transmission speed only), use the OPEN "COM:" statement in BHT-BASIC.

OPEN "COM: ... "　　Opens the interface port selected in System Mode.

OPEN "COM1: ... "　　Opens the IrDA interface port for data transmission, irrespective of the setting in System Mode.

OPEN "COM2: ... "　　Opens the direct-connect interface port for data transmission, irrespective of the setting in System Mode.

Note that it is impossible to open both the IrDA and direct-connect interface ports concurrently.

Through the interface port opened by the OPEN "COM:" statement, the XFILE statement transmits a designated file.

# Chapter 4

# Error Messages

This chapter lists the error messages which will appear on the LCD if some error occurs in the BHT.

# 4.1  System Errors

If some error occurs when the power is turned on or during program execution, one of the following error messages will appear on the LCD.

### System Program error

```
*****************
**  No System!  **
*****************
```
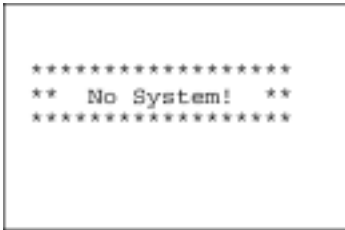
■ **Problem**

A System Program error has occurred.

**NOTE** If this error occurs, the BHT beeps five times (for 0.1 second per beep) and then turns itself off.

■ **Solution**

Contact your nearest dealer.

### Low battery warning

```
Battery voltage
     has lowered.
```
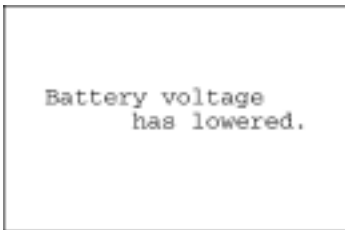
■ **Problem**

When the BHT is switched on or off or during execution of a program (System Mode or application), the battery output level has dropped below a specified lower limit.

**NOTE** If low battery is detected, the BHT displays this message for approx. 2 seconds and beeps three times (for 0.1 second per beep). After that, it will resume previous regular operation.

■ **Solution**

The battery cartridge will need to be recharged before long.

Replace or recharge the battery cartridge. (For the charging procedure, refer to Chapter 5, Section 5.5.)

## Shutdown due to low battery

```
Charge the
        battery!
```
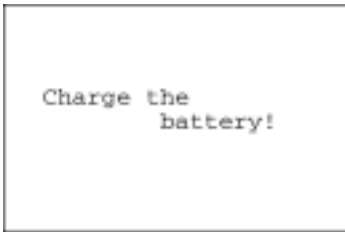
### ■ Problem

When the BHT is switched on or being on (including during execution of a program), the battery output level has lowered so that the BHT no longer operates.

NOTE   If lower battery is detected, the BHT beeps five times (for 0.1 second per beep) and then turns itself off. Depending upon the battery level, the beeper may not sound five times.

### ■ Solution

Replace or recharge the battery cartridge. (For the charging procedure, refer to Chapter 5, Section 5.5.)

## Calendar clock stopped

```
Set the current
date and time.

00/01/01 00:00

_ / /    :
```
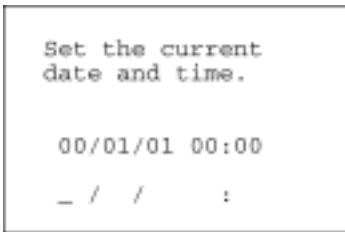
### ■ Problem

The calendar clock integrated in the BHT has stopped because:

- the battery cartridge had been removed for a long time, or
- the rechargeable battery cartridge had not been recharged for a long time

NOTE   The indication of 00/01/01 00:00 will change depending upon the calendar clock state.

### ■ Solution

Set the calendar clock (refer to Chapter 2, Section 2.3.2).

## Abnormal shutdown

```
Your terminal was
not shut down
properly the last
time it was used.


            [SF+2]
```

### ■ Problem

The BHT was shut down abnormally* and has been left without a battery cartridge loaded or with a discharged battery cartridge loaded, so unsaved data is lost.

(*"Normally shut down" refers to "the BHT is turned off with the **PW** key or by the auto power-off feature.")

```
Unsaved data
        was lost.


           [SF+2]
```

### ■ Solution

Refer to Chapter 2, Section 2.3.6 "BHT Turning-off Notes."

## System Program malfunction

```
Reload the battery
        to restart!


XXXXXXXX          01
```

### ■ Problem

During execution of System Program, the System Program has attempted to write onto the write-protected area of the memory.

(xxxxxxxx: Error address)

NOTE    If this error occurs, the BHT beeps five times (for 0.1 second per beep).

### ■ Solution

Unload and reload the battery cartridge, then turn the BHT on.

If this error occurs frequently, make a note of the displayed message and codes and contact your nearest dealer.

```
Reload the battery
        to restart!

tskid:XXXXXXXX
ercd :XXXXXXXX
addr :XXXXXXXX    02
```

### ■ Problem

During execution of System Program, the System Program has received an invalid command code.

(xxxxxxxx: Error address)

NOTE    If this error occurs, the BHT beeps five times (for 0.1 second per beep).

### ■ Solution

Unload and reload the battery cartridge, then turn the BHT on.

If this error occurs frequently, make a note of the displayed message and codes and contact your nearest dealer.

131
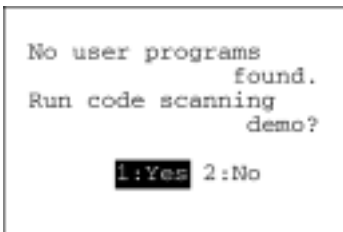
## No user programs found

■ **Problem**

When the BHT is turned on, no user programs are found.

■ **Solution**

You can run the code scanning demo without user programs.

Pressing "1:Yes" runs the code scanning demo. To start the demo, press the trigger switch. Selecting "2:No" turns the power off.

```
No user programs
              found.
Run code scanning
               demo?

      1:Yes 2:No
```
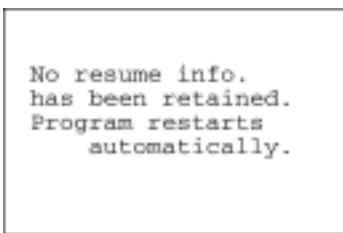
## Resume data lost

■ **Problem**

```
No resume info.
has been retained.
Program restarts
    automatically.
```

Although the resume function had been set to ON, no resume data has been retained since the BHT was not normally turned off and then left without a battery cartridge loaded or with a discharged battery cartridge loaded.

**NOTE** The BHT displays this error message for three seconds and automatically runs the execution program from the point of start-up.

132

## Error in System Mode settings

```
Your settings in
 System Mode
  have been lost.

Will reset
    to defaults.
```

#### ■ Problem

Your settings made in System Mode contain an error.

TIP  If this error occurs, the System Mode settings revert to the factory defaults.

TIP  The BHT displays this error for three seconds and runs a user program first loaded in the BHT from the beginning. The program may not be the auto-start executable program that has been specified before occurrence of the error.

If no user program is loaded in the BHT, this error message will be followed by a window asking whether or not to run the code scanning demo.

#### ■ Solution

Make your settings in System Mode again.

If the window asking whether to run the code scanning demo appears, activate System Mode and download user programs on the DOWNLOAD menu.

(For the downloading procedure, refer to Chapter 2, Section 2.5.3, [ 2 ]. For the start-up way of user programs, refer to Section 2.7.)

## System down error

```
Reload the battery
        to restart!

E:xxxxxxxx-F:xxxxxxxx
1:xxxxxxxx-2:xxxxxxxx
P:xxxxxxxx-R:xxxxxxxx
```

#### ■ Problem

An error has occurred during execution of System Program.

NOTE  If this error occurs, the BHT beeps five times (for 0.1 second per beep).

#### ■ Solution

Unload and reload the battery cartridge, then turn the BHT on.

If this error occurs frequently, make a note of the message and codes on the LCD and contact your nearest dealer.

## System administrator to be called

```
Contact your
    administrator.
Note the error
            number.
(XXXX)
```

### ■ Problem

Any of the following errors has occurred:

| | | |
|---|---|---|
| (1) | Hardware error or calendar clock error | (1010) |
| | Flash memory error | (1020) |
| (2) | Memory storage error | (20XX) |
| (3) | Execution program error | (3010) |
| | (XXXX: Error code) | |

TIP  If any of the above errors occurs, the BHT beeps five times (for 0.1 second per beep) and then turns itself off.

### ■ Solution

Turn the BHT on again.

If error (1) above occurs frequently, contact your nearest dealer.

If error (2) occurs frequently, initialize the BHT System (the whole user area including the font file area).

If error (3) occurs frequently, delete the execution program file that causes this error or download the original execution program file to overwrite the current one.

134

# 4.2   Errors in System Mode

If some error occurs during operation in System Mode, one of the following error messages will appear on the LCD.

### When selecting a program file or data file

```
   EXECUTE PROGRAM


******************
* NO FILE EXISTS *
******************
```
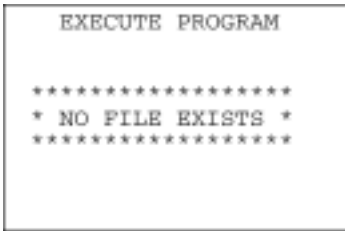
■ **Problem**

You attempted to execute a user program in the EXECUTE PROGRAM menu, but no user program files had been stored in the memory.

■ **Solution**

Press the **C** key to return to the SYSTEM MENU screen, then download user programs. (Refer to Chapter 2, Section 2.5.3, [ 2 ].)

```
 SET  EXECUTE  PROGRAM


******************
* NO FILE EXISTS *
******************
```
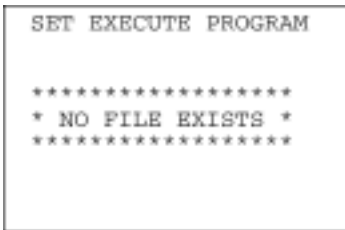
■ **Problem**

In the SET SYSTEM menu, you attempted to select a user program file as an execution program to be run when the power is applied, but no user program files had been stored in the memory.

■ **Solution**

Press the **C** key to return to the SYSTEM MENU screen, then download user programs. (Refer to Chapter 2, Section 2.5.3, [ 2 ].)

```
      UPLOAD FILE


******************
* NO FILE EXISTS *
******************
```
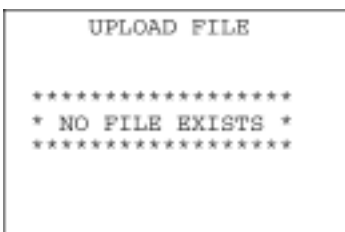
■ **Problem**

You attempted to select "ONE FILE" or "ALL FILES" for uploading in the UPLOAD menu, but no data files had been stored in the memory.

■ **Solution**

Press the **C** key to return to the SYSTEM MENU screen.

```
   DELETE FILE


*****************
* NO FILE EXISTS *
*****************
```
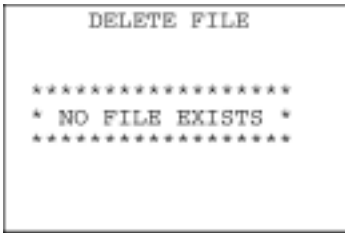
**■ Problem**

You have deleted all of the files stored in the memory in the DELETE FILE menu.

**■ Solution**

Press the **C** key to return to the SYSTEM MENU screen.

## During downloading of a program file, data file, BHT system parameter file, or system message file

```
  DOWNLOAD FILE

  XXXXXXXX.XXX
 Out of memory!!


Retry?
       1:Yes 2:No
```

**■ Problem**

The memory is insufficient for storing files to be downloaded.

**■ Solution**

Press the **2** key to return to the SYSTEM MENU, then delete unnecessary files in the memory or decrease the size of the file to be downloaded. (Refer to Chapter 2, Section 2.5.3, [ 8 ], [ 2 ], [ 10 ] and [ 12 ].)

```
    DOWNLOAD


 File mismatch!!


Retry?
       1:Yes 2:No
```

**■ Problem**

In the SYSTEM PARAMETER transfer menu, you attempted to download a file other than the BHT system parameter file. Or in the SYSTEM MESSAGE transfer menu, you attempted to download a file other than the system message file.

**■ Solution**

Check the file you attempted to download and then download the file in the appropriate menu (DOWNLOAD menu, SYSTEM PARAMETER transfer menu, or SYSTEM MESSAGE transfer menu).

```
    DOWNLOAD FILE

   XXXXXXXX.XXX
 Too many files!!


 Retry?
        1:Yes 2:No
```

**■ Problem**

The current download will exceed the maximum allowable number of files (120 files) in the memory.

**■ Solution**

Press the **2** key to return to the SYSTEM MENU, then delete unnecessary files in the memory (or decrease the number of files to be downloaded if you attempted to download more than one file in the DOWNLOAD menu.)

(Refer to Chapter 2, Section 2.5.3, [ 8 ], [ 2 ], [ 10 ], and [ 12 ].)

```
    DOWNLOAD FILE

   XXXXXXXX.XXX
 Communication error!!


 Retry?
        1:Yes 2:No
```

**■ Problem**

Downloading has failed.

**■ Solution**

To retry downloading, press the **1** key.

To return to the SYSTEM MENU, press the **2** key. Check the interface port, communications parameters, and communications protocol in the SET SYSTEM menu or perform the communications test in the TEST menu. (Refer to Chapter 2, Section 2.5.3, [4.5] and [5.7].)

It is also necessary to check the communications parameters setup of the host PC.

```
    DOWNLOAD FILE

   XXXXXXXX.XXX
 Program file error!!


 Retry?
        1:Yes 2:No
```

**■ Problem**

You attempted to download an invalid program file.

**■ Solution**

Check whether the program file you attempted to download is available to your BHT model. If it is not available, download the appropriate program.

## During uploading of a program file, data file, BHT system parameter file, or system message file

```
   UPLOAD FILE

   File error!!

Upload?
     1:Yes 2:No
```

■ **Problem**

The file you attempted to upload is damaged.

■ **Solution**

To upload the damaged file as is, press the **1** key.

```
      UPLOAD

Out of memory!!
```

■ **Problem**

The memory is insufficient for setting up the BHT system parameter file or system message file to be uploaded.

■ **Solution**

Press the **C** key to return to the SYSTEM MENU and delete unnecessary files. (Refer to Chapter 2, Section 2.5.3, [ 8 ].)

```
      UPLOAD

Too many files!!
```

■ **Problem**

The memory has already contained 120 files, so the BHT system parameter file or system message file cannot be set up.

■ **Solution**

Press the **C** key to return to the SYSTEM MENU and delete unnecessary files. (Refer to Chapter 2, Section 2.5.3, [ 8 ].)

```
   UPLOAD FILE
   XXXXXXXX.XXX
Communication error!!

Retry?
     1:Yes 2:No
```

■ **Problem**

Uploading has failed.

■ **Solution**

To retry uploading, press the **1** key.

To return to the SYSTEM MENU, press the **2** key. Check the interface port, communications parameters, and communications protocol in the SET SYSTEM menu or perform the communications test in the TEST menu. (Refer to Chapter 2, Section 2.5.3, [4.5] and [5.7].)

It is also necessary to check the communications parameters setup of the host PC.

This chapter describes the handling procedure of the communication unit CU-300, the interfacing with the host PC, and the charging of the battery cartridge. It also describes the LAN-support communication unit CU-311.

# Chapter 5

# Handling the CU-300 (Option)

# 5.1 Functions of the CU-300

The optical communication unit CU-300 series is available in three models: CU-301, CU-321 and CU-311. The CU-300 series has the following functions:

(1) Data exchange function

The CU-300 exchanges data and programs between the BHT and the host PC.

It interfaces with the BHT via the IrDA interface and with the host PC via the RS-232C interface (CU-301), USB interface (CU-321) or Ethernet 10Base-T interface (CU-311).

(2) Battery cartridge charging function

The CU-300 charges the lithium-ion battery cartridge loaded in the BHT.

**NOTE:** Before using the CU-321, you need to install the dedicated USB device driver stored in the CD-ROM that comes with the CU-321. For the installation/uninstallation procedure, refer to the guidebook that comes with the CU-321.

# 5.2   Components and Functions

**Indicator LED**
Shows the charging state.

**IrDA interface port**
Used to exchange data
optically with the BHT.

**BHT charge terminals**
Do not stain these
terminals; doing so could
result in a lower charging
efficiency. Clean these
terminals periodically.

**Status indicators**

**POWER LED (green)**
Lights when the power is
applied to the CU.

**DATA communications LED (green)**
Lights when the BHT is communicating
with the host PC.

**Interface connector**
Used to exchange data with the host PC or
communications station.

The CU-301/321/311 has an RS-232C port,
USB port or Ethernet port (10Base-T),
respectively.

**Protection sheet**

**DIP switch**
Used to set the CU's transmission speed.

**Power inlet connector**
Plug the AC adapter into this connector.

Without using the AC adapter, the CU-321 can work if the
power (5V, 500 mA) is supplied via the USB host or USB hub.

# 5.3   Applying Power to the CU-300

<u>CU-301:</u>

The CU-301 should be powered from a wall socket via the dedicated AC adapter. Connect the outlet plug of the AC adapter to the power inlet connector of the CU-301, then plug the other end into a wall socket. Pressing the | side of the power switch turns the CU-301 on; pressing the ○ side turns it off.

<u>CU-321:</u>

The CU-321 should be powered from a wall socket via the dedicated AC adapter or from the USB host (PC) or USB hub via the USB interface.

Connecting the AC adapter supplies power to the CU-321. If no AC adapter is connected, turning on the USB host (PC) and USB hub supplies power to the CU-321.

**NOTE:** To charge the battery cartridge, use the AC adapter except when the CU-321 is connected to a self-powered hub capable of supplying power (5V 500 mA) via the USB line.

**NOTE:** To charge the battery cartridge even when the USB host (PC) is in suspend mode, use the AC adapter.

<u>CU-311:</u>

The CU-311 should be powered from a wall socket via the dedicated AC adapter. Connect the outlet plug of the AC adapter to the power inlet connector of the CU-311, then plug the other end into a wall socket.

**Power inlet connector**

**AC adapter**

| ⚠ **WARNING** | • If smoke, abnormal odors or noises come from the CU, immediately unplug the AC adapter from the wall socket, disconnect the interface cable from the CU, and contact your nearest dealer.<br>Failure to do so could cause fire or electrical shock. | ⚠ 🔌 |
|---|---|---|
| | • If foreign material or water gets into the CU, immediately unplug the AC adapter from the wall socket, disconnect the interface cable from the CU, and contact your nearest dealer.<br>Failure to do so could cause fire or electrical shock. | ⚠ 🔌 |
| | • If you drop the CU so as to damage its housing, immediately unplug the AC adapter from the wall socket, disconnect the interface cable from the CU, and contact your nearest dealer.<br>Failure to do so could cause fire or electrical shock. | ⚠ 🔌 |
| | • Use the dedicated AC adapter only.<br>Failure to do so could result in a fire. | ❗ |
| | • Never use the CU on the line voltage other than the specified level.<br>Doing so could cause the CU to break or burn. | 🚫 |
| | • If the power cord of the AC adapter is damaged (e.g., exposed or broken lead wires), stop using it and contact your nearest dealer.<br>Failure to do so could result in a fire or electrical shock. | ❗ |

| ⚠ **CAUTION** | • If you are not using the CU for a long time, be sure to unplug the AC adapter from the wall socket and disconnect the interface cable from the CU for safety.<br>Failure to do so could result in a fire. | 🔌 |
|---|---|---|
| | • When caring for the CU, unplug the AC adapter from the wall socket and disconnect the interface cable from the CU for safety.<br>Failure to do so could result in an electrical shock. | 🔌 |
| | • Never cover or wrap up the CU or AC adapter in a cloth or blanket.<br>Doing so could cause the unit to heat up inside, deforming its housing, resulting in a fire.<br>Always use the CU and AC adapter in a well-ventilated area. | 🚫 |
| | • Keep the power cord away from any heating equipment.<br>Failure to do so could melt the sheathing, resulting in a fire or electrical shock. | 🚫 |

# 5.4  Communicating with the Host PC

## 5.4.1  Setting the Transmission Speed of the CU-300

**CU-301:** Set the transmission speed to the same value as that of the BHT and host PC, by using the DIP switch.

**CU-321:** The transmission speed is automatically determined by the host PC.

**CU-311:** Use the CU with the transmission speed fixed to 115,200 bps (default). (Do not disturb the DIP switch.)

Set the transmission speed of the CU-301 to the same value as that of the BHT and the host PC, by using the DIP switch next to the power inlet connector.

(1)  Remove the protection sheet of the DIP switch from the CU-301.

(2)  Set the selectors of the DIP switch as shown below.
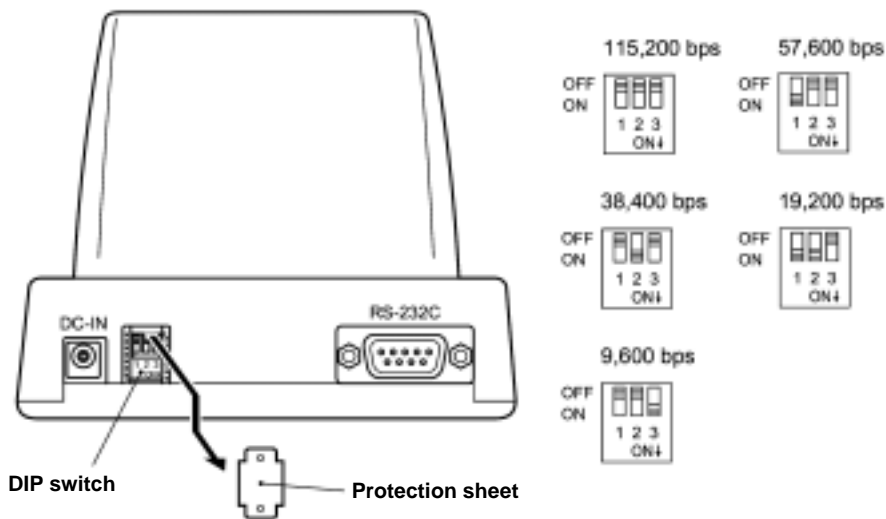


(3)  Reinstall the protection sheet.

NOTE    Do not set the DIP switch to any configurations other than one of the five shown above.

When removing the protection sheet, take care not to let any foreign material get into the CU.

# 5.4.2   Interface Cable Connection

(1)  CU-301/321: Unplug the AC adapter (if connected) from the wall socket.

(2)  Make sure that the host PC is turned off.

(3)  <u>CU-301:</u>    Connect the RS-232C interface cable to the interface port of the CU-301.

    <u>CU-321:</u>    Connect the USB interface cable to the interface port of the CU-321.

    <u>CU-311:</u>    Connect the Ethernet interface cable to the interface port of the CU-311.



**Interface cable**
CU-301: RS-232C
CU-321: USB
CU-311: Ethernet (10Base-T)
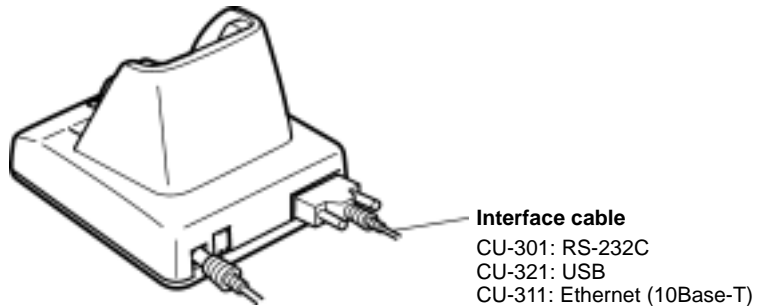
(4)  Connect the other end of the RS-232C/Ethernet/USB interface cable to the corresponding port of the host PC.

**TIP:** The CU-321/311 can be connected via a hub to the host PC.

# 5.4.3　Interfacing with the Host PC

## [ 1 ]　CU-301/321

This section describes how to start communication with the host PC in System Mode. The same can apply when you use a user program.

(1)　Turn the host PC on.

(2)　<u>CU-301:</u>　Turn the power switch on. The POWER LED comes on.

　　　<u>CU-321:</u>　If it is connected to the USB host, the POWER LED comes on. If it is connected to the USB hub, turning on the hub turns on the POWER LED. If the AC adapter is plugged in, the POWER LED is already turned on.

(3)　Turn the BHT off and then put it on the CU-301/321.



**CU-301/321**

**CU-301: RS-232C interface**
**CU-321: USB interface**

**AC adapter**
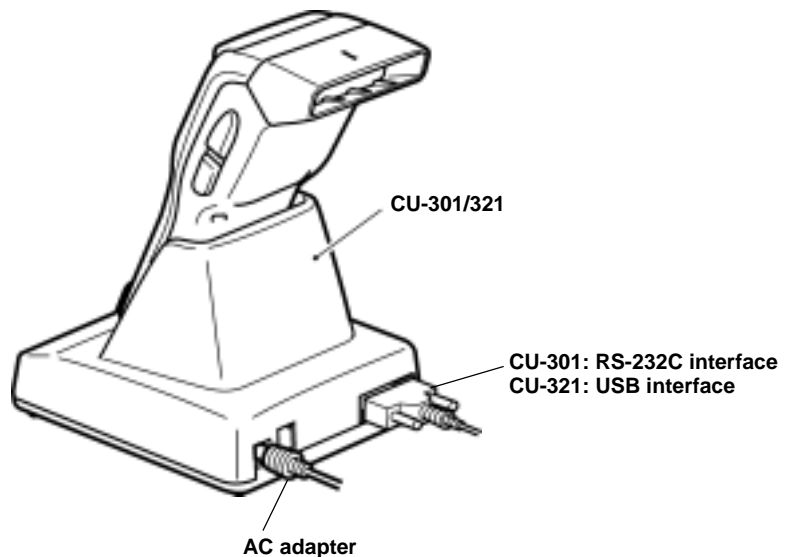
(4)　Turn the BHT on and run System Mode. Set the communications environments (communications protocol, interface port, communications parameters, and protocol options). Refer to Chapter 2, Section 2.5.3, [4.5].

Select the IrDA interface port.

(5)　On the host PC, initiate a communications program (e.g., BHT-BASIC4.0 Transfer Utility or equivalent).

(6)　To transfer data stored in the BHT to the host PC, select "UPLOAD" on the SYSTEM MENU. To transfer data from the host PC to the BHT, select "DOWNLOAD." Refer to Chapter 2, Section 2.5.3, [ 2 ] and [ 3 ].

The BHT and the host PC start communication with each other via the CU-300. On the CU-301/321, the DATA LED comes on upon start of communications, and after completion of communications, the LED goes off.

# [ 2 ]  CU-311

This section describes how to start communication with the host PC in System Mode (FTP).

(1)  Turn the host PC on.

(2)  Make sure that the AC adapter is plugged into a wall socket and the POWER LED is lit.

(3)  Turn the BHT off and then put it on the CU-311.



**CU-311**

**Ethernet interface**

**AC adapter**
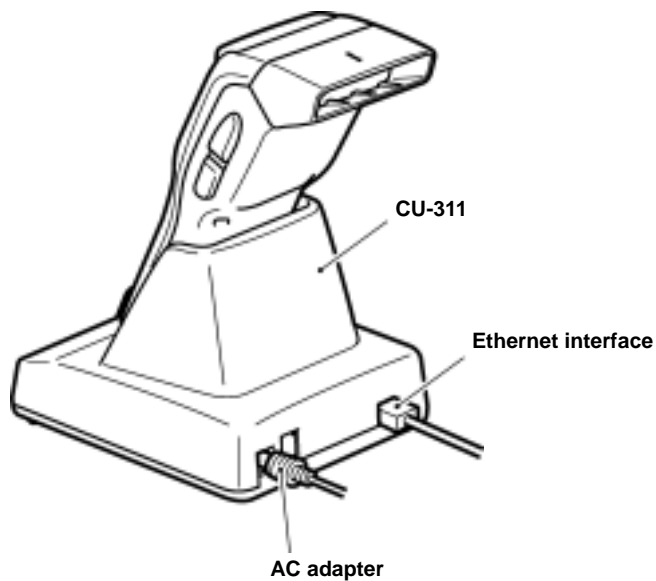
(4) Turn the BHT on and start System Mode. Set up the TCP/IP (device) or FTP (FTP server IP address, user ID, etc.). Refer to Chapter 2, Section 2.5.3, [4.9].

(5) On the host PC, initiate an FTP server program.

(6) To exchange data by FTP between the BHT and the host PC, select "FTP" on the SYSTEM MENU. Refer to Chapter 2, Section 2.5.3, [ 7 ].

The BHT and the host PC start communication with each other via the CU-311. Upon start of communication, the DATA LED comes on; after completion of communication, it goes off.

# 5.5 Charging the Battery Cartridge

You can charge a rechargeable battery cartridge being loaded in the BHT.

**NOTE** Service Life of Rechargeable Battery Cartridge:

Lithium-ion batteries used in the rechargeable battery cartridge will gradually deteriorate during the repeated cycles of charging and discharging due to its properties, even under normal use. When the battery service period becomes shortened due to its deterioration even if it has been charged for the specified hours, replace the battery cartridge with a new one. Generally, it is necessary to replace the battery cartridge after it has undergone approx. 300 cycles of charging and discharging operation.

(1) Turn the CU-300 on. The POWER LED comes on.

(2) Place the BHT loaded with a battery cartridge onto the CU-300.

The BHT turns on the indicator LED in red and starts charging. The charging time is approx. 3 hours (approx. 9 hours*).

(*When the CU-321 is powered from the USB host (PC) or USB hub)

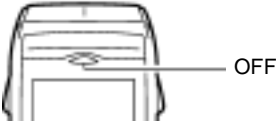Upon completion of charging, the indicator LED on the CU-300 lights in green.
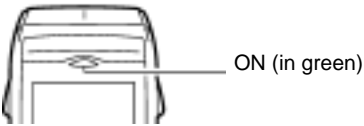
(3) Take the BHT off the CU-300.
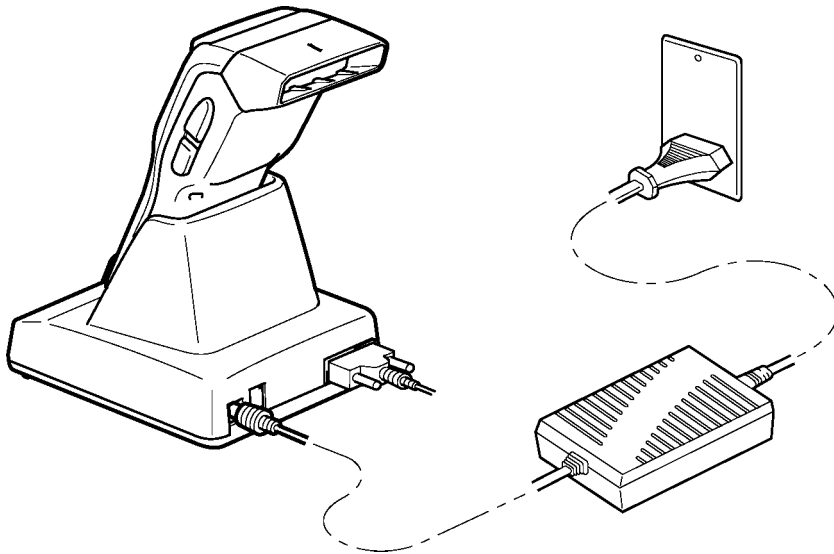


**TIP** The charging time is approx. 3 hours (approx. 9 hours) if the "Charge the battery!" message is displayed on the BHT. The battery cartridge not discharged so much will be fully recharged in shorter time.

■ **Charging Operation and LED Indication**

| Operator's Action | CU-300 Status | Indicator LED on the BHT |
|---|---|---|
|  | On standby | OFF |
|  | ⇓ |  |
| Place the BHT on the CU-300. | Normal charging | ON (in red) |
| ⇓ | ⇓ |  |
|  | Charging completed | ON (in green) |
| ⇓ | ⇓ |  |
| Remove the BHT. | On standby | OFF |

*When the CU-321 is powered from the USB host (PC) or USB hub.

If the CU-321 is self-powered via the USB interface from the USB host (PC) or USB hub and the host PC is in suspend mode, then the CU-321 cannot charge the battery cartridge.

If the host PC switches to the suspend mode when the CU-321 is charging the battery cartridge, then the CU-321 will stop charging. When the host PC recovers from the suspend mode, the CU-321 will start charging again. To prevent the CU-321 from getting affected by the suspend mode, use the dedicated AC adapter.

# 5.6 Functions Exclusive to the CU-311

## 5.6.1 Displaying the CU-311 Status

You can check the machine status of the CU-311 according to the ON/OFF states of the LED indicators (POWER and DATA) as listed below. For the charging procedure, refer to Chapter 5, Section 5.5, "Charging the Battery Cartridge."

| POWER LED | DATA LED | Machine status |
|---|---|---|
| OFF | OFF | Power off |
| ON | OFF | Power on |
| ON | ON | Communicating with the host |
| Flashing slowly[*1] | ON | Updating the CU system program |
| Flashing slowly | Flashing[*2] | Waiting for retry after occurrence of a CU system program updating error |
| Flashing slowly | Flashing slowly | System program failure<br><br>**Solution:** Contact your nearest dealer. |
| Flashing quickly[*3] | Flashing quickly | System program error<br><br>**Solution:** Restart the CU-311. If this error occurs frequently, contact your nearest dealer. |

[*1]  At one-second intervals
[*2]  At 100-ms intervals
[*3]  At 50-ms intervals

## 5.6.2　Displaying the CU System Information on the BHT

You can display the CU-311 system information on the BHT's LCD.

Set the BHT on the CU-311 and operate the BHT to display the SYSTEM INFORMATION screen on the LCD. From that screen, you can call up the system program version and MAC address.

For details about the displaying procedure of the CU system information, refer to Chapter 2, Section 2.5.3, "[ 6 ] System Information."

## 5.6.3　Updating the CU System Program via the BHT

You can update the CU-311 system program by using the BHT.

(1)  Downloading the CU-311 system program file

　　Download the CU-311 system program file to the BHT from the host PC.

(2)  Updating the current CU-311 system program

　　Set the BHT on the CU-311 whose system program should be updated. Operate the BHT to display the CU-F/W MODIFY screen where you can update the system program.

　　During updating, the POWER LED on the CU-311 will flash. (Refer to the Section 5.6.1.)

　　For details about the updating procedure, refer to Chapter 2, Section 2.6.2, "Updating the CU-311 System."

# 5.7  Interface Specifications

## [ 1 ]  Interface Connector and Pin Assignment

### CU-301

The CU-301 has an RS-232C interface port (Dsub-9P).



RS-232C Interface Port (Dsub-9P) on the CU-301

| Pin No. | Signal | Functions | Signal Input/Output CU-301 | External device |
|:---:|:---:|:---|:---:|:---:|
| 2 | RD | Receive data | ← | |
| 3 | SD | Send data | → | |
| 4 | ER | Data terminal equipment ready | → | |
| 5 | SG | Signal ground | — | |
| 6 | DR | Data set ready | — | |
| 7 | RS | Request to send | — | |
| 8 | CS | Ready to send | — | |

The input/output voltage threshold for the logical valued signal is listed below.

| Logical Value | Input Voltage Threshold | Output Voltage Threshold |
|:---:|:---:|:---:|
| 0 | $3V \leq n \leq 15V$ | 5V min. |
| 1 | $-15V \leq n \leq -3V$ | -5V max. |

### CU-321

The CU-321 has a Full-Speed USB 1.1-capable port (Series "B" receptacle).

## <u>CU-311</u>

The CU-311 has an IEEE802.3-compliant Ethernet interface port (10Base-T).



Ethernet Interface Port (RJ45 jack) on the CU-311

| Pin No. | Signal | Functions |
|:---:|:---:|:---|
| 1 | TD+ | Send data |
| 2 | TD- | Send data |
| 3 | RD+ | Receive data |
| 4 | N.C. | No connection |
| 5 | N.C. | No connection |
| 6 | RD- | Receive data |
| 7 | N.C. | No connection |
| 8 | N.C. | No connection |

The MAC address of the CU-311 is printed on the nameplate.

# [ 2 ]   Interface Cable Connection

## CU-301

As illustrated below, connect the CU-301 (on which the BHT is placed) to a host PC with a cross-mode cable. To connect it to a modem, use a straight-mode cable.
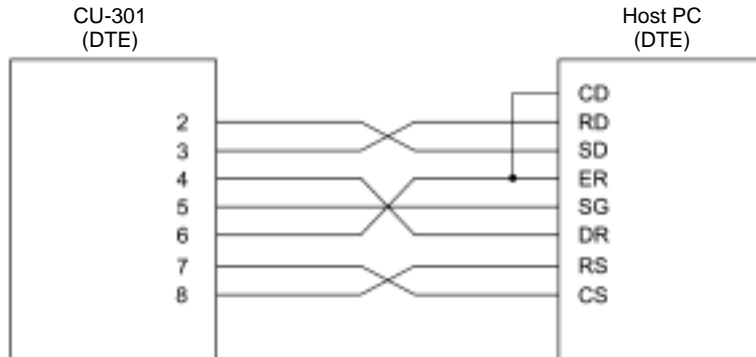


Cable Connection between CU-301 and Host PC



Cable Connection between CU-301 and Modem

DTE and DCE

In the RS-232C interface specifications, the DTEs (Data Terminal Endpoint) shall be generally connected with each other by a cross-mode cable; the DTE and DCE (Data Circuit Endpoint) shall be connected with each other by a straight-mode cable.

The DTE is one piece of equipment connected at both ends of a communications line as a sender or receiver of data (such as CU-301 on which the BHT is placed and a host PC).

The DCE is one piece of equipment connected in-between the DTE and the communications line and terminates communications lines. It converts their signals without any change in contents (such as modem or TA).

## CU-321

Use a cable that conforms to the USB specification.

## CU-311

Use a TIA/EIA Category 3 cable or higher one.

# Appendices

# Appendix A. Specifications

## A.1  BHT-300B

### [ 1 ]  Product Specifications

**Power Source**    Main power    Rechargeable lithium-ion battery cartridge (3.7 VDC)

**Dimensions** (W) x (L) x (H)    70 x 182 x 55 mm (2.8 x 7.2 x 2.2 inches)

**Weight**    Approx. 230 g (Approx. 8.19 oz.) including battery cartridge

**Operating Ambient Temperature**    -5°C to 50°C (23°F to 122°F)

**Operating Humidity**    20% to 80% (with no dew condensation)

**Ambient Illuminance**    500 to 3000 lux.
(Depth of field: 45 mm, PCS value: 0.9 min., Reflection intensity: 85% min. for white and 5% max. for black, Narrow bar width: 0.125 mm min.)

20 to 10,000 lux.
(Depth of field: 100 mm, ITF: 0.625 magnification, PCS value: 0.9 min., Reflection intensity: 85% min. for white and 5% max. for black)

**Controller**

| | |
|---|---|
| CPU: | 32-bit RISC |
| RAM: | 1MB |
| Flash ROM: | 4MB(BHT-302B) / 8MB(BHT-303B) |

**Keypad**

| | |
|---|---|
| Magic keys: | 4 |
| Function keys: | 8 |
| Numerical keys and others: | 16 |

**Display**

Type:    Dot-matrix, FSTN liquid crystal display (LCD) with backlight

Formation:    132 dots wide by 72 dots high

| Screen mode | Font size | | Chars x Lines | Dots (W x H) |
|---|---|---|---|---|
| Single-byte ANK* mode | Standard-size | | 22 x 9 | 6 x 8 |
| | Small-size | | 22 x 12 | 6 x 6 |
| Two-byte Kanji mode | 16-dot font | Full-width | 8 x 4 | 16 x 16 |
| | | Half-width | 16 x 4 | 8 x 16 |
| | 16-dot font (Double-width) | Full-width | 4 x 4 | 32 x 16 |
| | | Half-width | 8 x 4 | 16 x 16 |
| | 12-dot font | Full-width | 11 x 6 | 12 x 12 |
| | | Half-width | 22 x 6 | 6 x 12 |
| | 12-dot font (Double-width) | Full-width | 5 x 6 | 24 x 12 |
| | | Half-width | 11 x 6 | 12 x 12 |

*ANK: Alphanumerics and Katakana

**Calendar Clock**    Year, month, day, hour, minute, and second

Year: Two digits (with auto-correction on February 29 up to year 2099)

**Reading Confirmation LED**    Colors:  Red and green

~~EMC standard~~    ~~VCCI Class B~~

# [ 2 ]   Bar Code Specifications

## (1)  Available Bar Code Types

| Bar code type | Bar dimensions | Readable magnification |
|---|---|---|
| Universal product codes<br>    EAN-13<br>    EAN-8<br>    UPC-A<br>    UPC-E<br>    EAN-13 with add-on<br>    EAN-8 with add-on<br>    UPC-A with add-on<br>    UPC-E with add-on<br>        2-digit add-on<br>        5-digit add-on | 0.26 mm (10.24 mils) | 0.8 magnification min. |
| Interleaved 2of5 (ITF)<br>Standard 2of5 (STF)<br>Codabar (NW-7)<br>Code 39 | 0.125 mm min. (4.9 mils min.)<br>PCS value $\geq$ 0.9<br>Reflection intensity difference between white and black bars $\geq$ 0.8<br><br>0.15 mm min. (5.91 mils min.)<br>(PCS value $\geq$ 0.45) | |
| Code 93<br>Code 128 (EAN-128) | 0.15 mm min. (5.91 mils min.)<br>(PCS value $\geq$0.45) | |
| MSI | 0.20 mm min. (7.9 mils min.)<br>(PCS value $\geq$0.45) | |

## (2)  Optical Properties Required for Bar Code Labels

White bars:  Reflection intensity  45% min.

Black bars:  Reflection intensity  25% max.
            PCS value           0.45 min.

**(3) Bar Code Label Size**

Recommended width: 10 mm min. (0.39 inch min.)

| Length: | Depth of field (Distance from bar codes to the bar-code reading window) | Length of labels (including margins) |
|---|---|---|
| | 400 mm (15.75 inches) | 420 mm max. (16.54 inches max.) (Minimum narrow bar width: 1.0 mm min.)[4] |



**(4) Thickness of Bars and Depth of Field**

| Minimum narrow bar width | Depth of field | |
|---|---|---|
| 0.125 mm (4.92 mils) | 0 to 45 mm | (0 to 1.77 inches)[1] |
| 0.15 mm (5.91 mils) | 0 to 85 mm | (0 to 3.35 inches)[2] |
| 0.33 mm (12.99 mils) | 0 to 200 mm | (0 to 7.87 inches)[3] |
| 1.0 mm (39.37 mils) | 100 to 400 mm | (3.94 to 15.75 inches)[4] |
| 1.2 mm (47.24 mils) | 120 to 450 mm | (4.72 to 17.72 inches)[5] |

[1] Under the following conditions:
 - Ambient illuminance: 500 lux. (Fluorescent lamp)
 - Code 39, 19 digits
   Narrow bar: Wide bar = 1 : 2.2
 - Reflection intensity of white bars: 85% min.
   Reflection intensity of black bars: 5% max.

[2] Under the following conditions:
 - Ambient illuminance: 500 lux. (Fluorescent lamp)
 - Code 39, 15 digits
   Narrow bar: Wide bar = 1 : 2.2
 - Reflection intensity of white bars: 85% min.
   Reflection intensity of black bars: 5% max.

[3] Under the following conditions:
 - Ambient illuminance: 500 lux. (Fluorescent lamp)
 - EAN-13
 - Reflection intensity of white bars: 85% min.
   Reflection intensity of black bars: 5% max.
 - 1.0 magnification

[4] Under the following conditions:
 - Ambient illuminance: 500 lux. (Fluorescent lamp)
 - ITF conforming to the UPC Shipping Container Code
 - Reflection intensity of white bars: 85% min.
   Reflection intensity of black bars: 5% max.
 - 1.0 magnification

[5] Under the following conditions:
 - Ambient illuminance: 500 lux. (Fluorescent lamp)
 - ITF conforming to the UPC Shipping Container Code
 - Narrow bar: Wide bar = 1 : 2.2
 - Reflection intensity of white bars: 85% min.
   Reflection intensity of black bars: 5% max.
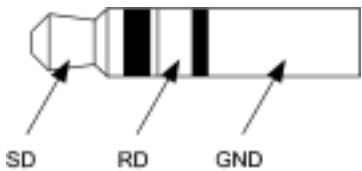 - 1.2 magnifications

# [ 3 ]    Interface Specifications

IrDA Interface

|  |  |
|---|---|
| Synchronization: | Start-stop |
| Input signals: | RD |
| Output signals: | SD |
| Transmission speed: | 115,200 bps max. |

Direct-connect Interface

|  |  |
|---|---|
| Synchronization: | Start-stop |
| Transmission speed: | 115,200 bps max. |
| Signal level: | Conforms to the RS-232C interface |
| Pin assignment: | As shown below. |



| Pin No. | Signal | Functions | Signal Input/Output BHT | External device |
|---------|--------|-----------|------------------------|-----------------|
| 1 | SG (GND) | Ground for signals |  |  |
| 2 | SD | Send data | $\rightarrow$ |  |
| 3 | RD | Receive data | $\leftarrow$ |  |

# A.2  CU-300

## [ 1 ]  Product Specifications

| | CU-301 | CU-321 | CU-311 |
|---|---|---|---|
| **Power Source** | 100, 120 or 230 VAC (via the dedicated AC adapter) | Powered from the USB interface* | 100, 120 or 230 VAC (via the dedicated AC adapter) |
| **Power Consumption** | 6.5 VA | 5V 500 mA | 7 VA |
| **Dimensions** (W) x (L) x (H) | 114 x 140 x 92 mm (4.49 x 5.51 x 3.62 inches) | 114 x 134 x 92 mm (4.49 x 5.28 x 3.62 inches) | |
| **Weight** | Approx. 200 g | | Approx. 210 g |
| **Operating Ambient Temperature** | 0°C to 40°C (32°F to 104°F) | | |
| **Operating Humidity** | 20% to 80% (with no dew condensation) | | |

*The CU-321 can be powered also from the AC adapter.

## [ 2 ]  Charging/Discharging Requirements (CU-301/321/311)
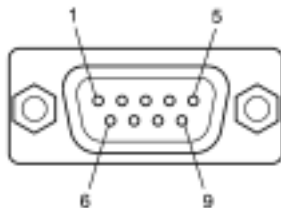
Charge current:    Approx. 790 mA

Charge time:        Approx. 3 hours (approx. 9 hours*)
                            (*When the CU-321 is powered from the USB host (PC) or USB hub)

# [ 3 ]   Interface Specifications

## CU-301



**RS-232C Interface Port (Dsub-9P) on the CU-301**

| Pin No. | Signal | Functions | Signal Input/Output CU-301 | External device |
|---------|--------|-----------|---------|-----------------|
| 2 | RD | Receive data | | ← |
| 3 | SD | Send data | | → |
| 4 | ER | Data terminal equipment ready | | → |
| 5 | SG | Signal ground | | |
| 6 | DR | Data set ready | | |
| 7 | RS | Request to send | | |
| 8 | CS | Ready to send | | |

NOTE   Shown below is a diagram of the internal connection in the CU-301.
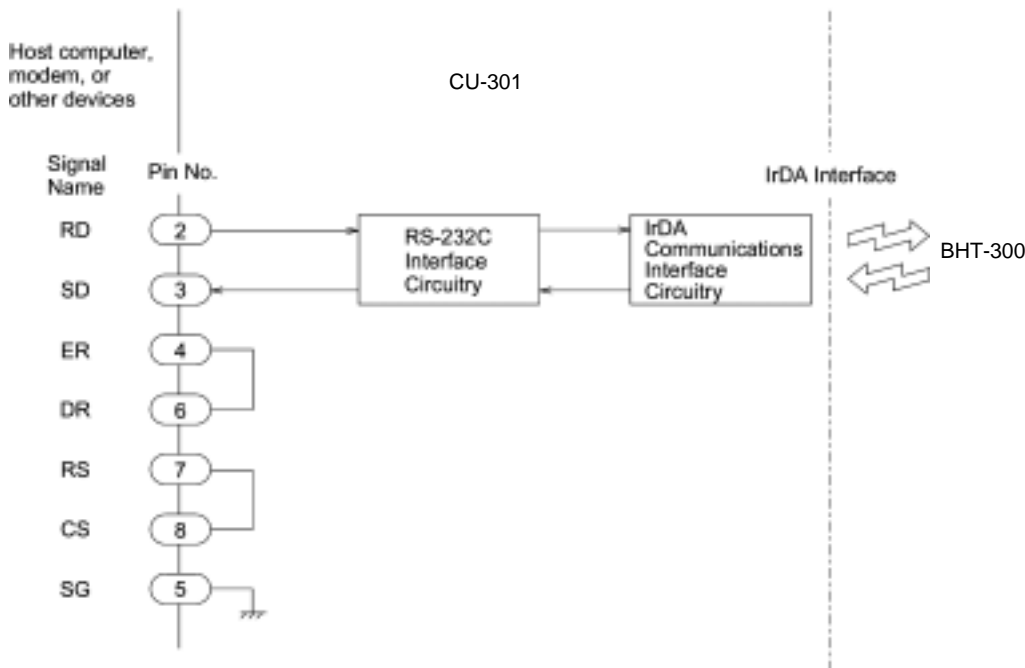
### CU-321

The CU-321 has a Full-Speed USB 1.1-capable port (Series "B" receptacle).

### CU-311

The CU-311 has an IEEE802.3-compliant Ethernet interface port (10Base-T).



**Ethernet Interface Port (RJ45 jack) on the CU-311**

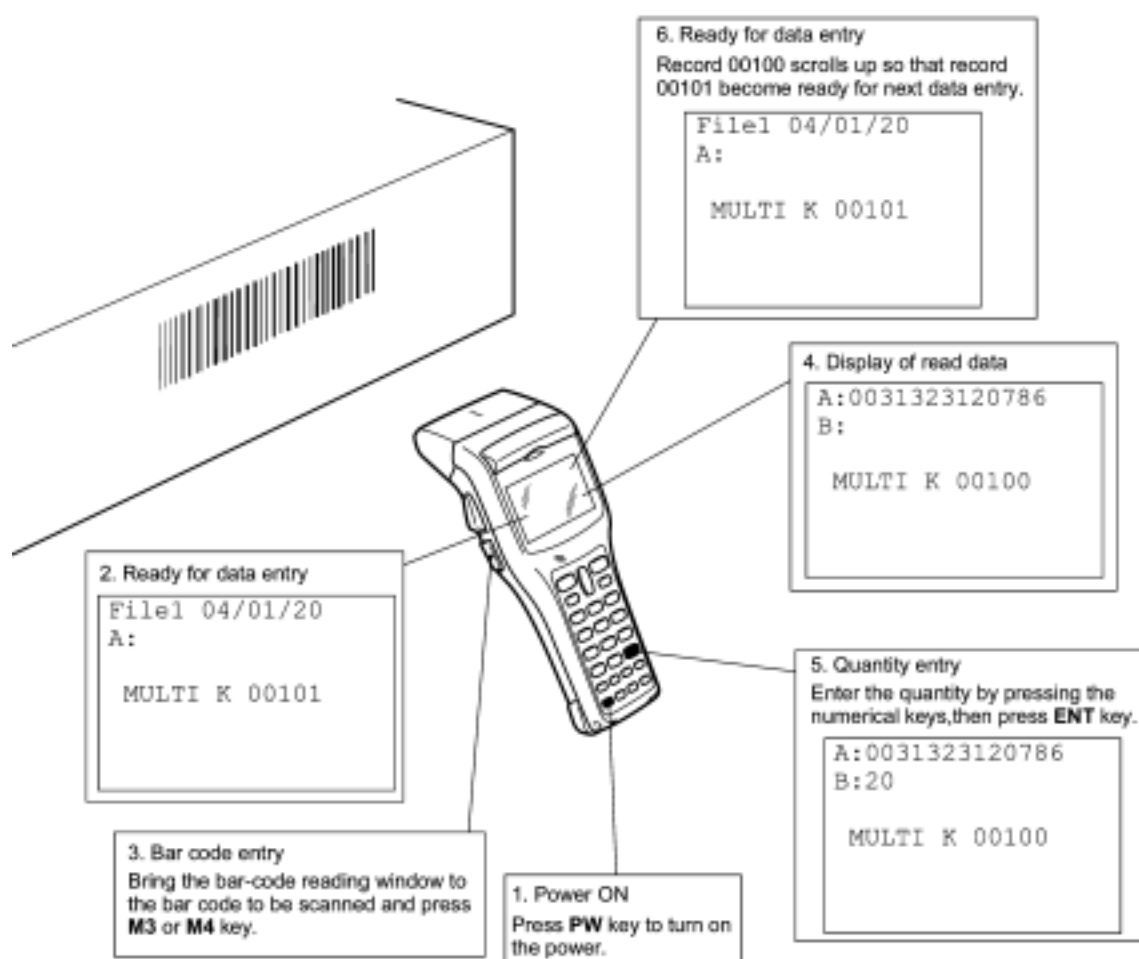| Pin No. | Signal | Functions |
|---------|--------|---------------|
| 1 | TD+ | Send data |
| 2 | TD- | Send data |
| 3 | RD+ | Receive data |
| 4 | N.C. | No connection |
| 5 | N.C. | No connection |
| 6 | RD- | Receive data |
| 7 | N.C. | No connection |
| 8 | N.C. | No connection |

# Appendix B.  A Typical Basic Operation

What follows is a typical basic operation that helps you instruct the hands-on user in practical bar-code reading operation.

Application type:    Inventory

Operation:    Power ON    →    Read the bar code on stock (A).    →    Key in the quantity.
Read the bar code on stock (B).    →    Key in the quantity.

Repeat the above operation.



6. Ready for data entry
Record 00100 scrolls up so that record 00101 become ready for next data entry.

```
File1 04/01/20
A:

 MULTI K 00101
```

4. Display of read data

```
A:0031323120786
B:

 MULTI K 00100
```

2. Ready for data entry

```
File1 04/01/20
A:

 MULTI K 00101
```

5. Quantity entry
Enter the quantity by pressing the numerical keys,then press **ENT** key.

```
A:0031323120786
B:20

 MULTI K 00100
```

3. Bar code entry
Bring the bar-code reading window to the bar code to be scanned and press **M3** or **M4** key.

1. Power ON
Press **PW** key to turn on the power.

# Bar Code Handy Terminal
# BHT-300B

## User's Manual

The purpose of this manual is to provide accurate information in the handling and operating of the BHT-300B. Please feel free to send your comments regarding any errors or omissions you may have found, or any suggestions you may have for generally improving the manual.

In no event will DENSO WAVE be liable for any direct or indirect damages resulting from the application of the information in this manual.